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The Economic Development of Iraq

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MAP I

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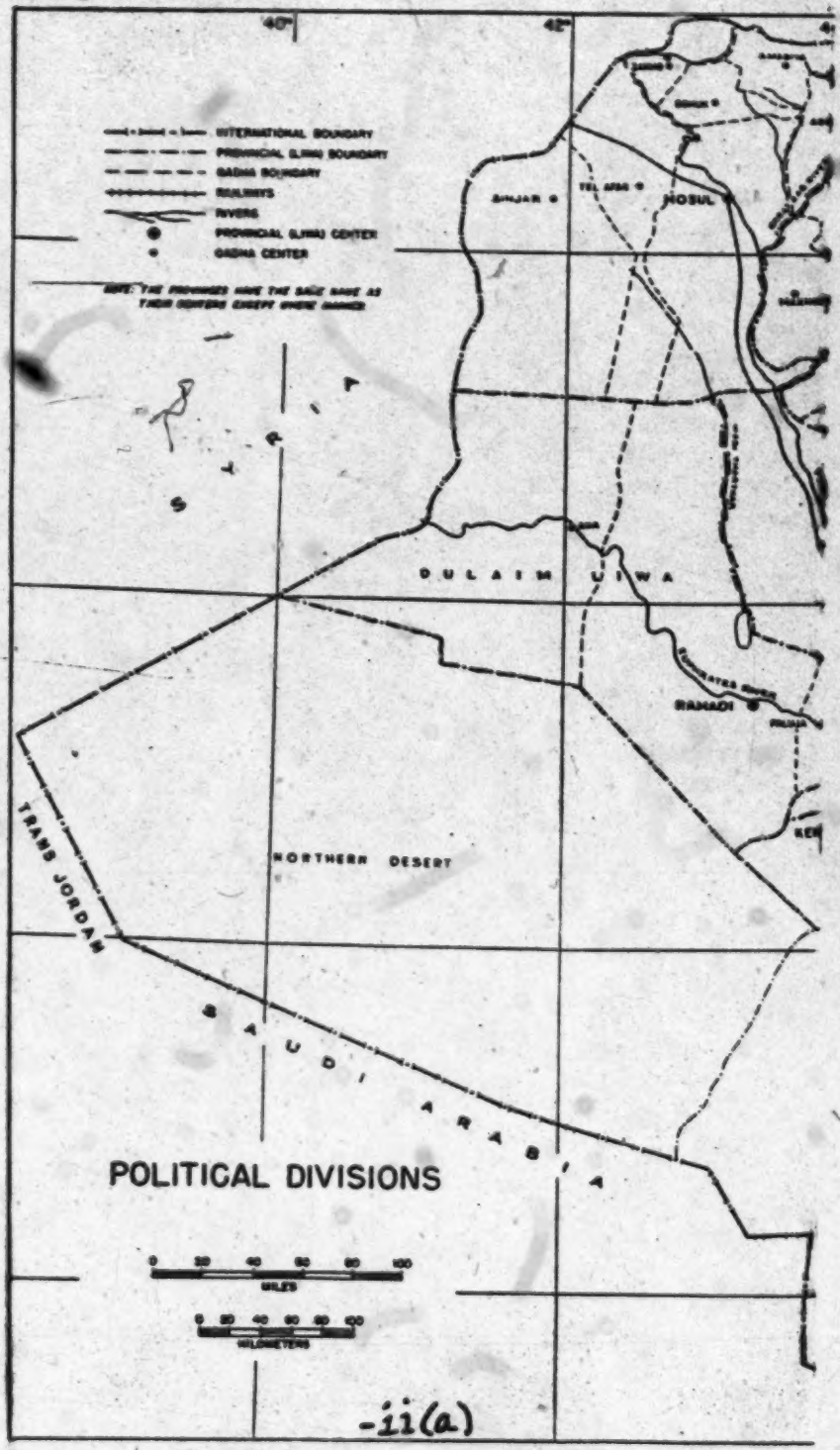

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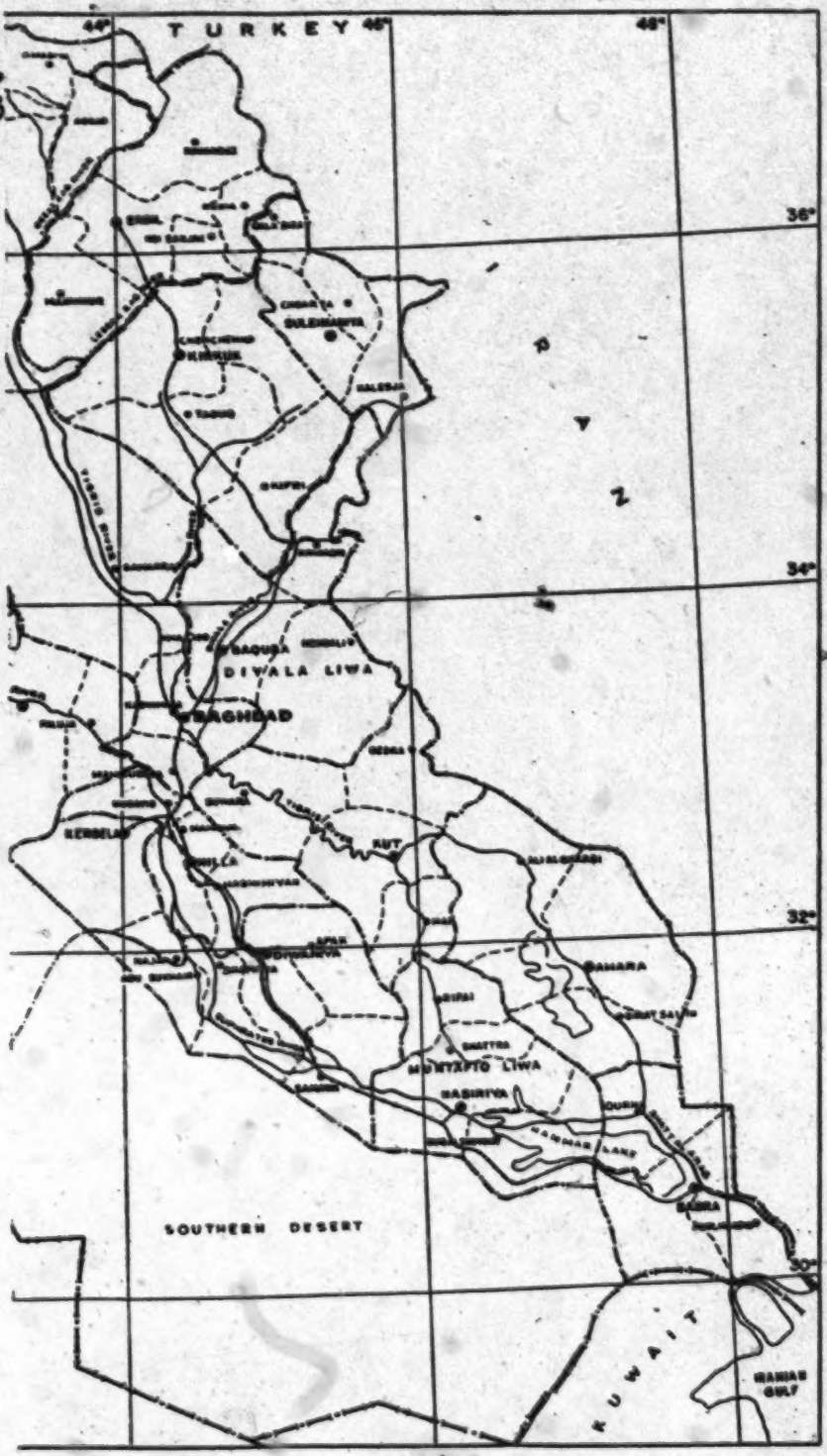

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The Economic Development of IRAQ

Report of a Mission organized by the International Bank for Reconstruction and Development at the request of the Government of Iraq.

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THE MISSION
[FROM THE INTERNATIONAL BANK]

IVAR ROOTH
Chief of Mission

JOHN C. DE WILDE
Chief Economist

JEAN R. DE FARGUES	*Adviser on Irrigation, Flood Control and Drainage*
CARL FLESHER	*Adviser on Industry and Power*
E. R. HONDELINK	*Adviser on Transportation*
LUTHER G. JONES	*Agronomist*
ANTONIO KAYANAN	*Adviser on Community Planning and Housing*
BENJAMIN B. KING	*Economist*
MIROSLAV A. KRIZ	*Adviser on Public Finance, Money and Banking*
ALBERT LORENZEN	*Adviser on Public Health*
C. H. J. MALIEPAARD	*Agricultural Economist*
K. G. SAIYIDAIN	*Adviser on Education*
C. W. SCHULLER	*Adviser on Public Administration*
T. THRELKELD	*Adviser on Animal Husbandry*

EUGENE TROY
Administrative Assistant

ROSE DILIBERTO
EUNICE O. DOREY
Secretaries

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INTERNATIONAL BANK FOR
RECONSTRUCTION AND DEVELOPMENT
WASHINGTON 25, D. C.

OFFICE OF THE PRESIDENT

February 11, 1952

His Excellency
Nuri Al Said
Prime Minister
Baghdad, Iraq

My dear Mr. Prime Minister:

I take pleasure in transmitting herewith the Report of the Mission to Iraq, organized by the International Bank for Reconstruction and Development at the request of the Government of Iraq.

The Bank hopes that the Report will contribute to an understanding and solution of Iraq's development problems and that it will be widely disseminated and discussed. You will understand, of course, that since the Executive Directors and the management of the Bank have not reviewed the Mission recommendations in detail, they are transmitted to you as the views of the Mission rather than positive recommendations of the Bank. We believe, however, that the Mission's Report deserves serious consideration and can be of substantial value in working out a development program and in framing the general economic policies relating thereto.

The Bank will follow with interest the action taken in connection with the Report. The Bank will be prepared, at the request of the Government of Iraq, to discuss any questions that might emerge from the study of the Report and to consider how the Bank can best help in the execution of the development program.

It is my sincere hope that the Report may be of positive and lasting benefit to Iraq.

Sincerely yours,

Eugene R Black

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2600 ROWLAND PLACE, N.W.
WASHINGTON, D. C.

000

February 8, 1952

The Honorable Eugene R. Black, President
International Bank for Reconstruction
and Development
Washington, D. C.

Dear Mr. Black:

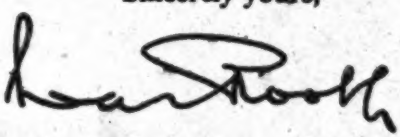
It gives me great pleasure to submit herewith the Report of the Mission to Iraq, organized by the International Bank at the request of the Government of Iraq. As you know, the conclusions and recommendations contained in the Report are based on studies made by the Mission in Iraq during the spring of 1951.

On behalf of the Mission, I would like to express our appreciation for the friendly cooperation which the Mission received from officials of the Iraq Government at every level and from Iraqi citizens in every walk of life. Without their generous assistance our task could not have been accomplished.

I am personally most grateful for the keen interest and wholehearted devotion which the individual members of the Mission brought to their work. They were at all times energetic and enterprising in the pursuit of their special studies. I am especially indebted to Mr. John C. de Wilde, my deputy, who was of invaluable assistance in the field and who, with the able collaboration of Mr. Benjamin B. King, carried so much of the burden of preparing the Report following our return. A word of appreciation is also due Miss Maxine MacKenzie for her untiring work in typing the manuscript of the Report.

It is the sincere hope of the Mission that the Report will contribute to the further development of the economy of Iraq and to a rise in the standard of living of its people.

Sincerely yours,



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PREFACE

121 On October 10, 1950, the Government of Iraq officially requested the International Bank for Reconstruction and Development to send a mission to Iraq to undertake a general review of the country's economic potentialities and make recommendations for a development program. After an exchange of views it was agreed that a mission would be sent with the following terms of reference:

> "The Mission will be expected to undertake a general review of Iraq's economic potentialities and to submit recommendations designed to assist the Government of Iraq to formulate a long-term program for the further development of the country's productive resources. Specifically, the report of the Mission is to include recommendations concerning:
>
> (1) investment priorities as among different sectors of the Iraqi economy and as among types of undertakings within each important sector;
>
> (2) the approximate rate of investment which can appropriately be undertaken without inflationary or other disruptive effects;
>
> (3) measures apart from capital investment which appear necessary or desirable for improving and increasing production;
>
> (4) economic and fiscal policies which may be important to accelerate the pace of Iraq's development; and
>
> (5) governmental organization and practices having an important effect on development."

114 A number of United Nations agencies cooperated in the selection of the personnel of the Mission. The agricultural economist, the agronomist and the expert on animal husbandry were nominated by the Food and Agriculture Organization of the United Nations, which also undertook to pay a portion of their salaries

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114 and expenses. The World Health Organization and the United Nations Educational Scientific and Cultural Organization nominated the specialists in health and education, respectively.

The Mission arrived in Iraq on February 25, 1951, and the last members left the country on May 27, 1951. During this period members of the Mission travelled widely about the country in order 000 to study conditions and problems at first hand. The Mission worked generally under the auspices of the Development Board, whose members and staff provided valuable assistance. The Principal Liaison Officer to the Mission, Mr. Naim Bashoo, greatly facilitated the Mission's work. In the course of its work, the Mission also drew on the resources of many other government departments and agencies whose cooperation was generously given. The Mission takes this opportunity to express its gratitude to the many people both in public and in private life who gave freely of their time and effort to help the Mission.

In the following report the Mission submits a series of recommendations over a broad field. In making these recommendations the Mission has taken into account the Development Board's five-year program without, however, attempting to arrive at a judgment on every one of the projects included in this program. The many conclusions and recommendations of the Mission may well be subject to modification in the light of additional information or of future developments. While the Mission enjoyed generous cooperation in obtaining data essential to its work, it was inevitably handicapped to some extent by the same lack of adequate, reliable information which is generally encountered in varying degrees in all underdeveloped countries. For example, the absence of dependable data on agricultural and livestock yields and on the location, extent and quality of cultivable but idle land made it difficult to assess the impact of various measures in the field of irrigation, drainage and agriculture. Similarly, lack of statistical data has made it difficult to determine, except in general terms, the repercussions which increased public expenditures might have on production, incomes, consumption and imports. The Mission does not believe, however, that these factors significantly affect the validity of its recommendations.

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The Mission's[1] report consists of two parts. The first part contains the major findings and recommendations of the Mission to which are attached appendices: one, listing the Mission's recommendations, one, sumarizing the Mission's suggestions for technical assistance; and a third on statistical organization. The second part consists of a series of monographs dealing with particular subjects. The first monograph is concerned with the basic factors and conditions in the economy of Iraq which the Mission has considered in framing its recommendations. The others set forth in greater detail the Mission's views on flood control, irrigation and drainage; agriculture and animal husbandry; industry; transport and communications; public health; education; and community planning and housing.

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1 - [International Bank Mission to Iraq, 1951--
Analyst]

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I. Introduction

Iraq possesses impressive potentialities for economic development. With a total population of about 5,000,000 and an area of 168,400 square miles, Iraq is sparsely populated in relation to its resources. Although all but a relatively narrow belt in the north and northeast has insufficient rainfall to sustain agriculture, the country's twin river systems—the Tigris and Euphrates—can provide large amounts of water for irrigation. Much of its soil is inherently fertile and with ample water, manpower and implements, the area under cultivation might be almost tripled. In oil, Iraq possesses not only a source of foreign exchange but also a cheap source of power and raw materials essential to the development of industry, agriculture and transportation; and it may have other mineral resources susceptible of commercial exploitation. There is little doubt that the country can ultimately maintain a much larger population on a considerably higher standard of living.

As yet, however, this economic potential is in sharp contrast to the poverty prevailing in Iraq. The standard of living of the people is extremely low. Income per capita is probably at most ID 30.[1] Almost 90 percent of the population are illiterate and many are subject to debilitating diseases such as malaria, hookworm and bilharzia. Housing and sanitation are for the most part primitive. The fundamental reasons for these conditions are low output and low productivity. Most of the manpower on the land is underemployed for a large part of the year, and considerable unemployment exists in the major cities. Vast tracts of land await reclamation and irrigation before they can be used. Much of the available water is wasted owing to lack of storage and regulation of flow. In the spring disastrous floods often inundate large areas; and in the fall water is acutely short. Agricultural output is hampered not only by the inadequate and irregular supply of water, but also by the progressive salination of the soil in the irrigated areas. Agricultural techniques are primitive, the number and quality of draft animals are inadequate and there is insufficient equipment. Industry is little developed. Although perhaps as many

[1] One Iraqi dinar equals £1 or $2.80.

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433 as 60,000 people are engaged in industrial production (other than oil), virtually all of these are employed in small undertakings where the work is largely done by hand and productivity is accordingly quite low. Probably only about 2,000 are working in what might be characterized as modern industrial plants.

654 651 382 Fortunately prospective increases in government revenues from oil now make it possible for the government to undertake a large-scale program for the development of the country. Past investments in the oil industry will in the future yield large dividends in the form of a rapidly increasing production of petroleum. [471] In accordance with an agreement reached in August 1951, subject to ratification by Parliament, the three internationally-owned oil companies operating in Iraq have undertaken to raise oil output, which amounted to only about six million tons in 1950, to 30 million tons per year by the end of 1955 and to turn over to the Iraqi government half of the profits before the deduction of taxes. On this basis it is anticipated that, over the next five years, the governmen may receive net revenues amounting to as much as 214 million dinars from oil alone. Under the terms of a law passed in 1950 these revenues will be available to finance development. They will be assigned to the Development Board, an autonomous agency established in 1950 to ensure greater continuity in the planning and implementation of development programs.

652 In the past, financial stringencies have severely limited public expenditures. The government has often had difficulty in making both ends meet. Severe economy has been the rule. Development outlays had to be kept small; government salaries were not raised in accordance with the increasing cost of living; and local administration was starved of funds. In the future the situation will be reversed. The principal task will be to find ways and means of spending rapidly increasing revenues in a manner which will contribute most effectively to the permanent development of the country. It is with this task in view that the Mission has drawn up its recommendations.

880 Any program for realizing the economic potentialities of the country should be broad in conception and well balanced. Investment outlays in dams and irrigation works, transport facilities and industrial plants must be complemented by increased expenditures

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of a recurrent nature on agriculture, health, education and other 000 significant activities. In some cases expenditures for these purposes will be of even greater importance in improving productivity and conditions of life than large capital projects. The program should not concentrate on investment in new irrigation works while continuing to neglect, as in the past, maintenance of those works already in existence. It must not provide for new schools and hospitals without considering the need for funds and training facilities to staff these and already existing institutions. There must be a proper interrelationship between the development of industry and agriculture and of agriculture and irrigation; and the development of transport and power facilities will need to be geared to that of production. A balance should also be maintained between projects and measures which will be effective in raising standards of living in the longer run and those which can be expected to yield benefits in the more immediate future. One reason why the longer-run measures are of vital importance is that the population will probably increase rapidly as soon as there is a substantial improvement in health conditions. At the same time, there may well be little improvement in the condition of the population if current development is limited, for instance, to making more land and water available without attempting the long and difficult task of teaching the people how to use them more efficiently.

In this connection the critical importance of education should not be underestimated. Improvement in the quality of manpower is vital to government, agriculture and industry. There is little point in increasing the means of production unless people can learn how to make better use of the resources available to them. Fundamental and widespread knowledge of the means to higher production, better health and hygiene are often more important than capital investments. The dissemination of practical knowledge, and of literacy as a tool for acquiring this knowledge, is essential in the long run to an improvement in production and living standards.

Attention should be focussed not only on the content of the development program but also on the means for carrying it out. The achievement of development outlays commensurate with the expected rise in oil revenues represents an immensely difficult task. It can only be accomplished if full advantage is taken of the techni-

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cal resources of other countries. It will be noted throughout this report that the Mission has made numerous recommendations for the procurement of foreign technical assistance. These recommendations are in no sense a disparagement of the talent and skills now available in Iraq. They represent rather a recognition that a country whose development has been severely handicapped by limited financial resources in the past cannot now suddenly expect to launch a development program involving rapid expansion in virtually every field without availing itself of the many opportunities to obtain technical help from abroad.

II. Agriculture

Any development program for Iraq must obviously put primary emphasis on agriculture. Over 60 percent of the population is engaged in agriculture, and both industry and commerce depend in turn largely upon farming and animal husbandry. Moreover, large increases in output can be realized both by raising the productivity of livestock and farm land already in use and by bringing under cultivation large areas presently idle.

Existing Conditions

Agriculture in Iraq is devoted largely to the cultivation of winter crops. Because of the lack of rain in the summer, during that season crops can be grown only under irrigation. In the rainfed zone of the North, summer crops can be grown only on a moderate scale in small irrigated areas. In the irrigated zone of central and southern Iraq the limited water supply restricts the area devoted to summer crops to only about one quarter of that grown to winter crops. Barley and wheat are the only significant winter crops, while rice and, more recently, cotton are the principal summer crops. The area sown to sesame, corn, millet and grain sorghum is comparatively insignificant. Tobacco assumes some importance in the mountainous areas of the North. Fruit and vegetables are quite important. Iraq is the world's principal producer and exporter of dates; excellent citrus fruit is grown, particularly in the Diyala Valley in east-central Iraq, for domestic con-

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sumption; and other fruits and nuts are cultivated, mainly in the North.

Livestock raising is an adjunct to agriculture rather than an integral part of it. Sheep and goats predominate because they thrive despite poor grazing and feeding. Sheep and goats, as well as camels, are kept primarily by pastoral nomads who probably number well over 200,000. Cattle and water buffaloes are the livestock of the settled agricultural population. Many peasants, however, have no livestock at all except for a draft animal or two. Livestock are left to forage for themselves, with only some supplementary feeding with straw and perhaps barley in the winter. Only livestock in and around the cities are systematically fed.

Crop yields are generally low. The water supply is frequently inadaquate. Agricultural methods have on the whole remained unchanged for centuries. Little or no animal manure or fertilizer is applied to the soil, animal dung being used largely for fuel. Crop rotation is wholly inadequate and makes little or no provision for soil-building crops. Salinity, attributable to poor drainage, has materially lowered the productivity of land in the irrigation zone. Owing to insufficient and poor draft animals and lack of proper equipment, the soil is often poorly prepared, and weeds detract from the yields. Up to half of the winter crop area is left fallow as a means of restoring fertility, but since the land is generally allowed to go up in weeds to afford grazing for animals, the efficacy of the fallow system is limited. The productivity of livestock is also low, primarily because of inadequate feeding, but also because of poor breeding, disease and insufficient shelter.

Except for some rather limited areas in various parts of Iraq and a promising settlement in the Dujaila district of south-central Iraq, the country is almost wholly devoid of peasant proprietors. The ownership of cultivated lands is largely in the hands of sheikhs and urban proprietors who entrust the actual cultivation in small parcels to sharecroppers. These sharecroppers have neither the equipment nor the knowledge to increase production and for the most part eke out a bare subsistence.[2] The land assigned to the

[2] According to the cadastral survey which is half completed, 67.1 percent of the privately-owned land is in units exceeding 1,000 donums. (One donum equals 0.25 hectares or 0.617761 acres.)

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fellah or peasant generally changes from year to year so that the cultivator has virtually no incentive to improve it. Moreover, the sharecropping system discourages the cultivation of animal fodder crops since the customary apportionment of shares between landlord and tenant does not lend itself readily to such crops. Most of the landowners themselves show little interest in improving agriculture. Enjoying a large share of the crop with the expenditure of little or no effort on their part, they have little incentive to raise output. In recent years, however, an increasing number of landlords have been displaying a direct interest in improving crops and diversifying production. Some of them have been instrumental in raising production by installing pumps for irrigation, introducing new and more remunerative crops such as cotton, and investing in agricultural machinery.

The depressed economic condition of the fellah or sharecropper undoubtedly retards progress. It undermines the health and vigor of the rural population, limits the market for industrial products and may in the long run jeopardize the stability of the social order. The sharecropper's plight is attributable both to his poor economic bargaining position and to the low productivity of agriculture. In the irrigation zone the fellah generally gets only half of the crop even though the state has provided the irrigation works; and his share falls substantially below this percentage whenever the land is irrigated by privately-owned pumps or the landlord supplies seed, draft animals or machinery. In a country where capital is scarce in relation to manpower, the ability to provide the means of production—land, seed, animals and machinery—almost invariably also carries with it the ability to exact a high proportion of the return. In Iraq this is reinforced by a law which forbids the sharecropper to leave the land as long as he is indebted to his landlord, which is generally the case. In the long run the sharecropping system could be made quite tolerable if the productivity of the land were raised; and the economic bargaining power of the sharecropper could be increased by giving him access to the means of production—seeds, animals and implements—on more favorable terms through such institutions as cooperatives. In the shorter run, however, the sharecropper's position is likely to improve only as the landowner takes steps to improve his lot in order to keep him

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on the land. There is apt to be increasing pressure on the landowner to take such steps as a result of the growing opportunities for alternative employment created by a large increase in public expenditures on development, the expansion of industry and the opening of state lands to settlement. In fact, unless the sharecropper's status is improved, there is a great danger that there will be a continued flight of labor from the land, impairing the country's agricultural production.

The government itself has made only a modest contribution to the advancement of agriculture. The Directorate-General of Agriculture is only a subordinate department in the Ministry of Economics and has been severely handicapped by lack of funds and a shortage of competent agricultural officers. While it has had some success in combatting pests and diseases and in the extension of such crops as cotton and citrus fruit, too little attention has been devoted to practical research, and almost no field work has been carried out to assist cultivators in improving their crops and methods of cultivation. The expenditures of the Agriculture and Veterinary Departments were actually cut from ID 1,160,000 in 1948-49 to ID 540,000 in 1950-51 and, at the latter figure, represented only 1.8 percent of the total budget outlay. Expenditures on both agriculture and irrigation 1950-51 amounted to only 6.7 percent of the total.

Plans for the future now envisage large water storage and irrigation projects to provide more water for land already in use and to increase the area under cultivation and provide for the settlement of new land. These plans are in general quite sound. They will be largely ineffective, however, unless at the same time more stress is placed on arresting the deterioration of land already in use by extensive drainage schemes and on raising the productivity of agriculture by other means. The establishment of an efficient extension service and the provision of incentives to improve methods of cultivation are particularly important in this connection.

Expansion of Area under Cultivation: Irrigation

Extension of the area of land under cultivation is vitally important not only to an increase in production, but, above all, as

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311 a means of establishing a class of independent peasant landowners capable of earning a decent livelihood. Official estimates indicate that the amount of "cultivable" land is almost three times that under cultivation. The criteria used in determining the cultivability of land have, however, probably varied widely. Thus part of the cultivable land in the so-called rain-fed zone in the north may well be in areas sub-marginal from the standpoint of rainfall. As soon as possible the government should classify the cultivable land which is not presently cultivated by types of soil and determine what measures are required in each instance to put the land under cultivation, e.g. whether the land must be reclaimed by drainage and whether, if the land needs to be irrigated, the irrigation should be by pump or by flow.

Most of the area which can be put under cultivation will require water, yet, under current conditions, the supply of water does not even permit the effective irrigation of the area already in use. Projects for the storage of the excess water which pours down the Tigris and Euphrates rivers during the spring flood season and
653 frequently unloosens destructive floods are clearly essential. The
312 government has already initiated work on the Habbaniya Lake storage scheme for the Euphrates River and has let a contract for the first stage of the Wadi Tharthar flood control project on the Tigris River. The program of the Development Board also makes provision for storage dams on two tributaries of the Tigris, the Lesser Zab and the Diyala River. While the Derbend-i-Khan dam on the Diyala River will provide primarily for the more effective irrigation of land already under cultivation, completion of the Dokan dam on the Lesser Zab and of the Habbaniya Lake project should provide enough water to extend the cultivable area under irrigation from about 11 million donums at present to approximately 15 million.

The Mission fully endorses these projects (see map), with the proviso that borings prove the soundness of the Dokan dam site. At the same time it recommends that they be complemented by the construction at an early date of the Bekhme dam on the Greater Zab River for which no provision has yet been made. This dam would compensate for the diversion of the Lesser Zab water from the Tigris by the Dokan dam. Without the Bekhme dam the

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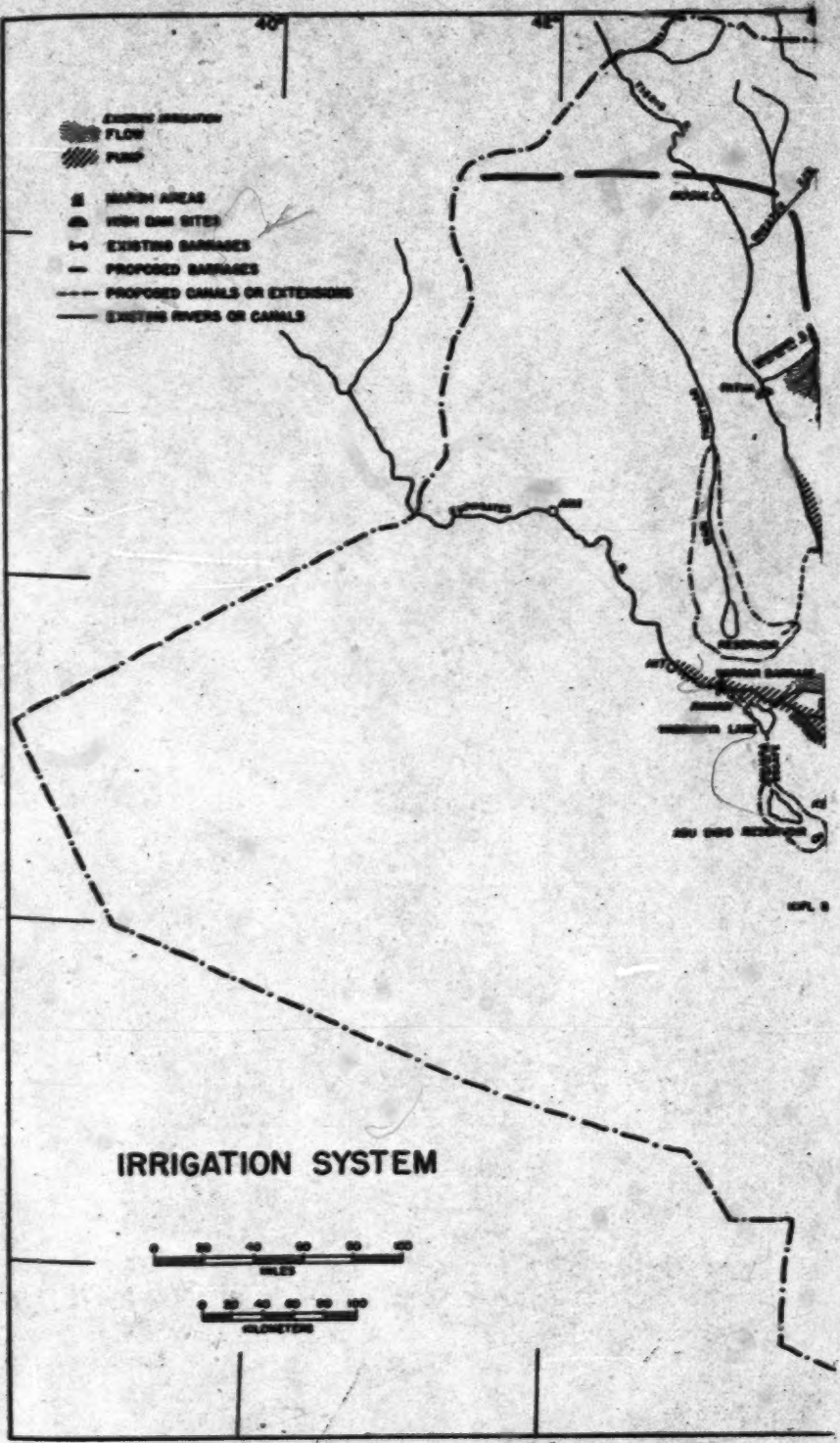

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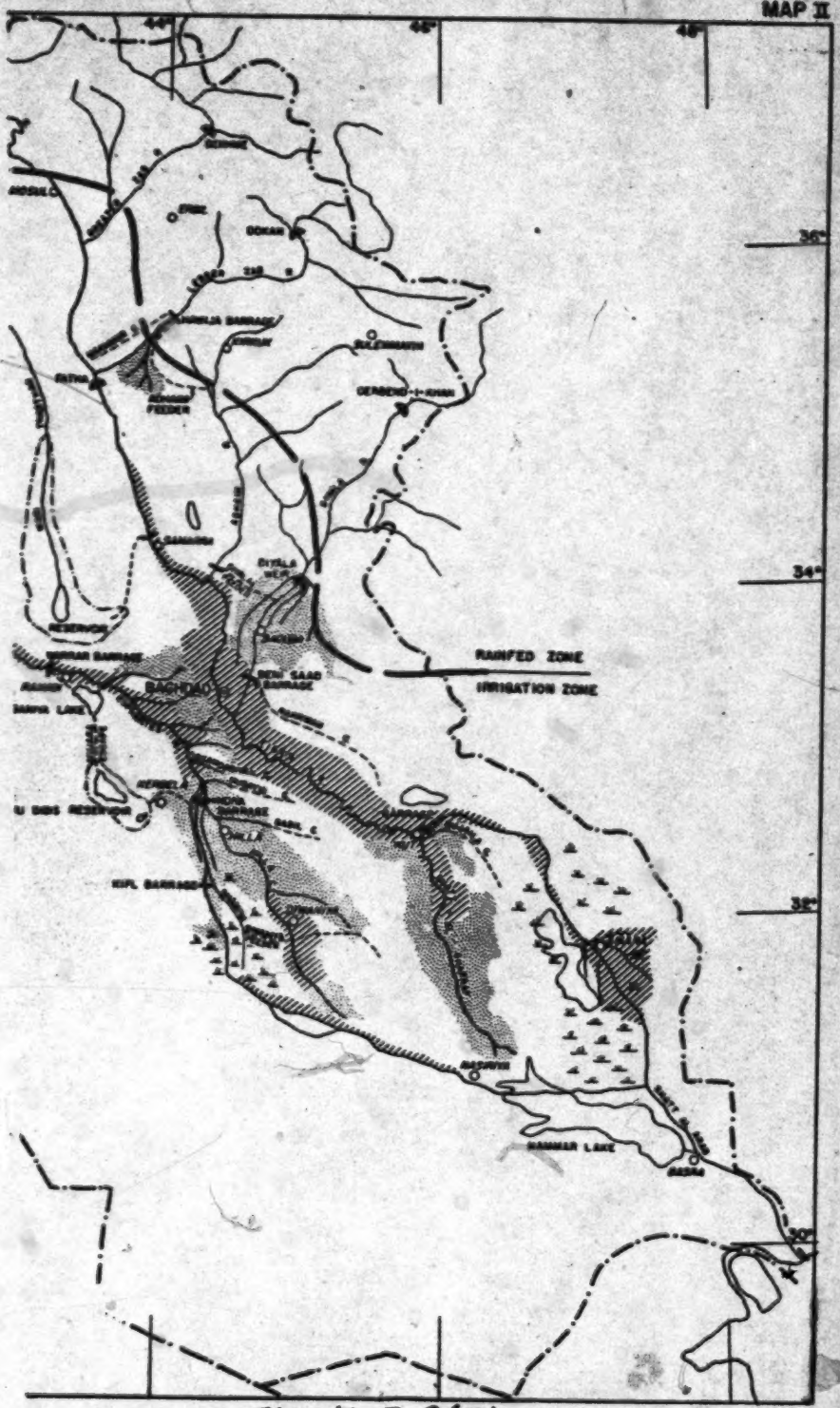
MAP II



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653 312 already existing water shortage in the Kut and Amara regions in southern Iraq would become more acute. Its construction is all the more urgent because the Wadi Tharthar reservoir will not supply supplementary water for the Tigris for another decade at best. In fact, some geologists believe that loss of water in the reservoir may be such that little or no water for irrigation will ever be furnished by the Wadi Tharthar. Should the Wadi Tharthar ultimately prove able to supply water for irrigation, the water impounded by the Bekhme dam could be utilized for the irrigation of the Erbil plain in northern Iraq.

Completion of the final stage of the Habbaniya project calls for the storage in the Abu Dibis and related depressions of water in excess of the expanded capacity of Habbaniya Lake and, in theory, would also permit a substantial extension of irrigation in the Euphrates Valley. Further study is required before beginning this stage of that project, however, because there is great danger that the salt in the depression may make the water unfit for irrigation, or at least dangerous to use, until after the completion of drainage facilities for all the areas irrigated from the Euphrates. At the same time the technical possibility of providing alternative storage capacity through the erection of a dam on the upper Euphrates near Ana should be explored.

[648] The irrigation projects outlined above necessitate agreements with Syria, Turkey and Iran regarding the conservation and utilization of the water of the Euphrates and the Tigris and their tributaries. An agreement with Syria is particularly urgent, since the extensive irrigation development possible in that country might adversely affect Iraq. With Turkey and Iran it is important to conclude understandings for joint afforestation and other water conservation measures in the watershed of the Tigris and its tributaries. Afforestation and other anti-erosion measures in the international watersheds of the two rivers will effectively complement the flood-control features of the water storage schemes.

650 In the monograph on irrigation the Mission has given a tentative selection of the irrigation projects which it believes should be initiated to utilize the waters of the new reservoirs. In view of the inadequacy of the information at its disposal, the Mission suggests, however, that its recommendations be reviewed in the light of a

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number of factors including (1) the cost and the technical aspects of the irrigation works, (2) the agricultural potentialities of the land affected, (3) the location of the land in relation to the availability of potential settlers, and (4) the ownership of the land. The first three of these need no elaboration. The fourth is important primarily because, provided adequate consideration is given to the first three factors, it would presumably be desirable to give priority to the irrigation of those lands which are clearly part of the state domain and which therefore would be available for distribution to small-holders.

Before laying out new irrigation projects the basic premises on which such projects have been designed in the past should, we suggest, be re-examined. Hitherto such projects have been laid out on the assumption that half of the area devoted to the cultivation of winter crops would lie fallow annually. The area in summer crops has not been considered since, in the absence of water storage facilities, the amount of water available limited the area that could be devoted to summer cultivation to about 15 to 20 percent of that in winter crops. The fallow system was regarded as necessary to permit the soil to rest and recover its fertility and to enable the land to dry out and the water table to sink, thus minimizing to some extent the danger of salinity. In the future the government will have the opportunity, through organized settlement and development of the new land, to prescribe the use of better systems of crop rotation which will more effectively maintain soil fertility; and the simultaneous installation of drainage facilities, now universally acknowledged to be essential, will prevent salination. At the same time the completion of the large storage projects will presumably permit some control over the distribution of water for winter crops on the one hand and summer crops on the other. Thus it will be desirable to determine, within the limits of flexibility set by the available water supply, the proportion of winter to summer crops which promises the largest overall yield, having regard both to improved crop rotation and to better utilization of manpower on the land. Such a reexamination of the premises on which irrigation projects have been designed in the past may lead to the conclusion that the area to be covered by irrigation canals using a given quantity of water can in future planning be reduced.

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Greater attention should also be paid to measures which would insure more economical use of available water, thereby making possible a further expansion of the area under cultivation in the irrigation zone. Among these are the installation of regulators on the Gharraf canal, for which provision has already been made in the Development Board's program, and more effective regulation of the lower reaches of the Tigris and Euphrates to prevent the dissipation of water into the extensive marshes in the South. Leaks from canals, which are sometimes quite substantial, should be reduced to a minimum, if necessary by lining certain sections of the canals. Above all, the wasteful use of water in irrigation should be arrested. The amount of water used for each crop in Iraq is generally much greater than that in the irrigated areas of other countries. At present, water is used lavishly over wide areas in an effort to wash accumulating salt from the roots of crops. In the end this only accelerates the progressive salination by raising the water table which brings up and precipitates the salt. The installation of drainage facilities which will lower the water table will therefore be the most effective means of preventing wastage of water. There is also an urgent need, however, to ascertain through practical experimentation, carried out under the joint technical supervision of agricultural and irrigation experts, the optimum amount of water required for each crop and to disseminate these findings among the cultivators.

The completion of the water storage facilities and irrigation works mentioned above will undoubtedly create some problems of adjustment. In a few places pump-irrigated lands will have to be abandoned as the consequence of new flow-irrigation schemes, and the people affected will require resettlement. In an area of about 750,000 donums the natural flooding of rice lands practised in some districts will presumably no longer be possible, and new methods of rice culture will need to be introduced. Rice patches will have to be terraced to permit the progressive flow of water from one terrace to the next and fertilizers used in the place of silt to replenish the soil; alternatively, new crops may have to be introduced. In some cases, partial resettlement of the people affected may need to take place. Even under existing conditions, however, problems of readjustment arise. Natural inundation, for example,

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has led to the progressive silting and raising of rice lands, thereby pushing rice culture deeper into the marshes.

Finally, the Mission wishes to emphasize the importance of improved operation and maintenance of existing irrigation works. To insure proper functioning of the irrigation system the canals must be equipped with an adequate system of regulator intakes and distributors. Rational distribution of water is often impeded by ancient water rights which insure some landowners a disproportionately large share. In times of scarcity the apportionment of water is often hotly disputed and subject to favoritism. The right of access to water across the lands of other farmers is inadequately insured. A sufficient number of adequately compensated irrigation officials of acknowledged probity is necessary to a fair distribution of water. They should be assisted by local councils of farmers who would gradually learn to approach the problem of equitable distribution in a cooperative spirit.

Lack of maintenance has been a serious problem in the past. To facilitate maintenance, irrigation systems should be equipped from the very beginning with such works as roads along canals, canal crossings for people and livestock, water-holes and washing places. To insure adequate operation and maintenance in the future, the Mission recommends that the annual budget of the Irrigation Department, which has averaged only ID 270,000 over the last ten years, should be increased progressively to about ID 1,000,000. The technical supervisory and planning staff also needs to be strengthened

The Rain-fed Zone

Except for some areas west-northwest of Kirkuk and the possibility of ultimately irrigating part of the Erbil plain with the water stored behind the Bekhme dam, large-scale irrigation schemes for the North do not appear feasible. Lack of suitable dam sites and topographical difficulties militate against such schemes. Smaller projects, utilizing the water of small streams, springs or wells are possible, however, and these should not be neglected in favor of the more striking, larger schemes. In many parts small streams and springs are already being used, but with direction and stimulus provided by the government these could be improved and many

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more brought into use. The government should take steps to survey the possibilities for small projects and to provide assistance in carrying them out, thus giving aid and security to the farm population of the North which now feels that its needs have been neglected and overlooked.

In general, however, the North will have to remain dependent on rain-fall to sustain its agriculture. There are apparently still considerable rain-fed areas which can be settled and put to the plow. Particular care should be exercised, however, to insure that the areas are not sub-marginal from the standpoint of either rainfall or fertility and that settlers are really available in the North, which is generally more sparsely settled than the central and southern portions of Iraq. For example, the Mission believes that the prospect of scanty and uncertain rainfall will probably make it undesirable to proceed, except on a very restricted, experimental basis, with the settlement scheme near Balad Sinjar in Mosul province which has been projected by the Agriculture Department.

Settlement of New Land

In the past much of the vacant land available for an expansion of crop production which ostensibly belonged to the state has fallen into the hands of big landowners. The so-called Land Settlement Law of 1932, which inaugurated a cadastral survey for the purpose of settling the past confusion regarding land titles and systems of tenure, facilitated this process. It permitted the land settlement committees appointed to administer the law to grant titles (so-called *lazmah* grants) to people who could demonstrate that they had made productive use of land within the previous fifteen years. In practice, it has been possible to obtain title on the presentation of proof that a crop was produced on the land in one year, and the land settlement committees have occasionally accepted even more tenuous proof of cultivation. In this way many sheikhs and other influential persons have managed to obtain title to large tracts of land without any payment whatsoever. Since the cadastral survey is only about half completed, more land may be preempted in this way unless a limit is set on such acquisitions.

Land definitely adjudged to be state (*miri sirf*) property by the land settlement committees has, however, been set aside for

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425 421 166 distribution to selected settlers under the terms of a law passed by Parliament in the spring of 1951. This law reflects a growing realization that a class of independent small-holders needs to be created. Settlement areas ranging in size from 2,000 donums in the mountains to 20,000 donums in flow-irrigated land and 80,000 donums in the dry-farming zone are to be established. Units up to 20 donums in mountainous land, 100 donums in flow-irrigated lands, 200 donums in lands irrigated by low-lift pumps and 400 donums in dry-farming lands are to be distributed among farmers, with preference to be accorded to those living in or near the settlement areas. Up to 20 percent of each area may also be allotted to graduates of agricultural schools and former members of the police and army, and up to 25 percent to civil pensioners and unemployed school graduates, provided that the committee responsible for the administration of the whole scheme is convinced of their agricultural capabilities. Settlers will be given the opportunity to participate in the work of preparing each area for settlement. The committee will plan the whole settlement, including the sites of houses and public buildings which are to be constructed in accordance with its specifications. The committee will also issue instructions regarding the type and method of cultivation. After ten years farmers who have made good will be granted title to their land without charge, and for a further period of ten years they will not be permitted to alienate their land in any way or to mortgage it except to the state Agricultural Bank. The only exception to this kind of distribution and settlement will be made in the case of state lands which can be irrigated only by high-lift pumps. Such lands may still be leased in tracts up to a maximum of 5,000 donums to a single individual.

425 421 This law, properly administered, will undoubtedly result in great benefit to Iraq. The Mission urges, however, that the government insist on the principle that settlers farm their land themselves without resort to sharecroppers. Otherwise there is a danger that a considerable number of minor landlords will be created, thus defeating the fundamental purpose of the scheme. This principle may be jeopardized both by the selection of non-farmers as beneficiaries and by the contemplated allotment of excessively large

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plots to single individuals in the pump-irrigated and dry-farming areas. 425 421

While sympathizing with the desire to provide in some way for unemployed school graduates and retired civil servants, army and police personnel, the Mission believes there is serious danger that these types of beneficiaries will tend to become landlords who will entrust the farming of their plots to others. The success of the settlement schemes may easily be endangered if the land falls into the hands of absentee landlords or of people with little or no farming experience. In any event there are many farmers in relatively overcrowded rural areas with better claims to the new land.

The proposed allotments, particularly in the dry-farming and pump-irrigated areas, may well be too large unless there is assurance that the farmers will have access to adequate machinery to till their land. The relatively large allotment in pump-irrigated lands as well as the exemption of lands irrigated by high-lift pumps from distribution to small-holders appear to be based on the assumption that only larger landholders can afford the necessary investment in pumps. In the past when capital was scarce, the installation of pumps was left to merchants and landowners who consequently were able to reap high returns in the form of a large proportion of the resulting agricultural output. Now that the government is assured of ample financial means in the future, it might consider financing the construction of pumping stations and providing pumps at cost to groups of settlers organized into cooperatives which would undertake to operate the pumps and gradually repay the government. Under such conditions the justification for larger allotments of pump-irrigated lands would tend to disappear. The Mission therefore suggests that the government review the size of the allocation to each farmer and that it reserve to itself the right to reassign a portion of the allotment if one farmer should prove incapable of cultivating it.

The Mission also makes two other recommendations. The first is that the right of sale after the initial period of 20 years be limited in such a way as to give the government an option to purchase for the purpose of preventing the land from falling into the hands of absentee landlords. The second is that the provision enabling settlers to acquire their land without cost be reconsidered.

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The Mission believes that the settlers should, as a matter of general principle, be required to make some payment for the extensive benefits received. This is all the more necessary in order not to widen unduly the disparity between the economic status of the favored settlers and that of the great majority of cultivators who will continue to work under much less favorable conditions. Such payments need not be excessively burdensome, since they could be spread over a number of years.

The new law will apply on a broad scale the basic principles of the Dujaila land settlement scheme in south-central Iraq. In the period 1946 to 1950, 1,058 farmers were settled there on 100-donum plots allotted from state-owned irrigated land. The Mission was impressed by the results achieved through this scheme. The farmers, who used to be sharecroppers, are conscious of their new-won independence and dignity. By comparison with the fellahin in neighboring areas they appear prosperous and content. Many of them are members of a cooperative—the only one of its kind in Iraq—which owns 10 tractors, two lorries, a flour mill and a club-house. Although the accounts of this cooperative leave much to be desired, its operations are generally along sound lines and indicative of what can be accomplished through state-assisted self-help. The Dujaila scheme is, however, not without defects. Its success as an agricultural venture is jeopardized by the progressive salination of the land because of failure to provide drainage facilities —an omission which should be promptly remedied. The administrative staff appears to be excessively large. Small-scale "landlordism" has crept in, since some farmers have brought in others to do a large part of their work on a sharecropping basis. The farmers were settled in a scattered fashion without regard to the need for community life. Most important, aside from insisting on small fruit gardens, the committee in charge of the project has effected no improvement in farming methods. The Department of Agriculture is not even represented on the committee, and there are no agricultural experts in the project capable of assisting farmers in raising their standards of cultivation. The improved economic position of the cultivators in the Dujaila scheme is almost wholly due to the fact that the farmer there has a larger plot of land and does not need to surrender a share of his output to a landlord. In the

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new settlements the government will have a unique opportunity to remedy the shortcomings of the Dujaila project.

Improvement in Productivity

While expansion of land under cultivation, particularly through large irrigation schemes, is essential in the long run to provide for a growing population and to establish a socially desirable class of smallholders, it should not be undertaken without a simultaneous vigorous campaign to increase the productivity of agriculture and livestock. The temptation to neglect such an effort in favor of striking new irrigation schemes should be resisted. Among the measures upon which this campaign should concentrate are drainage, the provision of better tools, seeds and draft animals, the introduction of soil-building and forage crops, the use of fertilizers, the improvement of livestock, the planting of trees and the establishment of an effective extension or advisory service to farmers.

1. Drainage

The drainage of existing irrigated lands would make the most important single contribution to increasing the productivity of agriculture. Moreover, it will also have the most immediate effect since it can be carried out by the government while the success of virtually all other measures to raise productivity depends on the necessarily slow process of persuading farmers to abandon age-old methods of cultivation.

The Haigh Irrigation Commission, which made an extensive study of irrigation and flood control for the government, estimated a few years ago that about 60 percent of the land irrigated by flow had been seriously affected by salt. The Mission's own inquiries and observations indicate that as much as 20 to 30 percent of cultivated land has been abandoned over the last few decades because of salt accumulation, while on a large part of the remaining land yields have declined by 20 to 50 percent and even more. In a number of new irrigation projects such as Hawija and Dujaila salting forced abandonment of part of the land within two years after the schemes were initiated. Drainage, almost totally neglected in the past, should therefore be prosecuted with utmost vigor in the future.

The main drainage canals for the whole irrigation zone have been projected, but it is now necessary to proceed with detailed

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312 planning and execution. First priority should be given to the drainage of the areas irrigated by the canals dependent on the Hindiya barrage on the Euphrates. A complete drainage network should be laid out as soon as possible for the Aggar Qub region, where drainage studies have already been carried out, in order to determine through practical experimentation the most appropriate design and spacing of the subsidiary drainage canals. Prompt attention should also be given to the drainage of the Dujaila area in order to halt the rapid deterioration of the land which may otherwise endanger the success of this important social experiment. Altogether the Mission believes that about ID 7,000,000 should be allotted to drainage over the next five years. This compares with a sum of ID 2,000,000 provided in the initial five-year program of the Development Board. So important is drainage that the Mission recommends that it be given priority over new irrigation schemes whenever a limitation of resources makes it impossible to carry out both simultaneously.

Since landowners will benefit greatly from drainage, they might reasonably be required to pay at least some part of the cost. Consideration might therefore be given to the imposition of a levy to pay the cost of subsidiary drainage canals. Construction of such subsidiary canals should not be optional with the landowners because failure to build them across one man's property might deny the benefits of drainage to adjoining properties.

2. Tools and Draft Animals

241 In the recent past much stress has been placed in Iraq on agricultural mechanization. In large parts of the country, particularly in the dry-farming zone, natural conditions are undoubtedly favorable to the use of tractors. The use of threshing machines or combines has also been shown to have the advantage of producing a far cleaner grain than that obtained through the customary method of threshing by flaying and the tramping of animals. For a long time to come, however, the great majority of Iraqi farmers will be unable to afford the purchase or rental of power machinery even on deferred payment; and many others will find mechanized farming unprofitable particularly as long as the cost of machinery remains so high in relation to the cost of labor. For most farmers the provision of simple tools as well as more and better draft ani-

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mals offers a more practical answer to their needs at this time. 241
Experience in Iraq shows that tractor plowing may increase yields by 20 to 50 percent, largely through more effective destruction of weeds and partly also through better preparation of the soil. Much the same effect could, however, be achieved through better animal-drawn plows replacing those which now, for the most part, barely scratch the surface and fail to uproot the weeds. Means for the acquisition of such tools and improved draft animals should be created through the organization of cooperatives and the provision of better credit facilities.

Mechanization will nevertheless play an increasingly important role in the future, especially as labor becomes more scarce and additional land becomes available for cultivation. Mechanization has already facilitated the expansion of cultivation in the dry-farming areas of Mosul and the new pump-irrigated lands in central Iraq. While certain areas in the irrigation zone are undoubtedly overpopulated in relation to land currently available, in other areas, particularly in the rain-fed zone, labor is scarce relative to the supply of land. As development schemes are launched and new land is opened up for settlement, the available manpower on lands already under cultivation may well be reduced. The government will need therefore to take steps to insure that mechanization will keep pace with developing requirements. In the period immediately ahead, however, the government should be mindful of the possibility that mechanization initiated by landowners may result in a substantial reduction of the portion of the crop going to sharecroppers or in the displacement of sharecroppers before alternative means of employment or settlement become available. Through its control over the importation and distribution of machinery and the extension of credit for the purchase of such machinery, the government will have the power to influence the direction of mechanization and thus minimize to some extent possibly adverse social consequences.

At present only a small portion of Iraqi agriculture is mecha- 407
nized. Combines and tractors in operation are reported to number 475
320 and 750 respectively, with about half of the number concen- 427
trated in the provinces of Mosul and Baghdad. Of these, 75 com- 647
bines and 81 tractors are owned by the Agricultural Machinery

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Administration, an autonomous agency within the Ministry of Economics. The AMA rents this machinery to farmers and, in addition, is responsible for testing and demonstrating new machinery, licensing of imports and controlling the distribution of the limited supply of spare parts in order to prevent black-marketing.

Some provision for rental of machinery, whether by the government or by private enterprise, will be necessary for some time, partly because it enables farmers to become acquainted with the value of such machinery and partly because many farmers do not have sufficient capital for outright purchase. As long as private enterprise is incapable of providing this service at reasonable rentals or until cooperatives can be established, continuation of the government rental service appears essential. On the whole, therefore, the AMA's three-year program to replace and expand its machinery park and to equip repair shops appears desirable despite the obvious drawbacks of government operation. At present, however, the AMA is operating at a substantial loss. In the calendar year 1951, for instance, its rental income will probably not exceed ID 50,000 compared with estimated operating costs, including depreciation, of about ID 150,000. Since the beginning of 1950, when it started operations as a fiscally autonomous agency, it has had to cover its deficits out of the ID 500,000 capital which the government undertook to provide. While the government should probably defray that part of the AMA's expenditures not directly attributable to the rental operations, the overall deficit should be reduced by gradually increasing rental charges. Rental charges on tractors, in particular, appear unduly low and may be depriving private persons of the incentive to purchase tractors either for their own use or for rental to others.

Since the overhead costs of the AMA's rental operations will probably always remain rather high and its machinery must be transported over considerable distances, it is important that the government encourage as much as possible private purchase and operation of machinery. The extension of credit for this purpose appears essential. At present, however, the Agricultural Bank cannot lend money on farm equipment partly because it is short of funds and partly because such loans would not afford sufficient security in the absence of any legal requirement to register title TO MACHINERY.

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to machinery. In the future cooperative ownership and operation, especially in the new settlement areas, should be encouraged as one of the best means of extending the use of machinery on a practicable and economical basis. The experience of the Dujaila cooperative, which, owing to low overhead and transport costs, rents machinery to its members at rates lower than those of the AMA and yet is apparently able to cover the cost of depreciation, seems promising in this respect.

Lack of repair facilities and spare parts have greatly handicapped mechanization. The government is seeking to overcome this difficulty both by establishing its own repair shops and by requiring importers to provide repair facilities and maintain minimum stocks of spare parts. Such centrally located shops will be available, however, only for major repairs. Since local repair facilities are now almost wholly lacking, steps should also be taken to establish a considerable number of small shops equipped to undertake minor repairs. In addition, courses designed to train drivers in elementary maintenance are urgently needed. The cost of mechanization will remain discouragingly high unless the life of machinery is prolonged by more adequate maintenance and repair.

3. Soil-building and Forage Crops: Fertilizers

The cultivation of soil-building and forage crops is virtually unknown even though the fertility of the soil needs to be replenished and an improvement in feed supply would make the greatest single contribution to an increase in the low productivity of livestock. In the irrigation zone berseem clover, sown in the grain stubble in late summer, would provide a particularly good pasture, soiling and hay crop. In the rain-fed region winter oats and vetch, when cut and cured, would provide a good reserve feed. In the irrigation zone quick-growing crops such as millet could be grown for summer pasture; and more corn, sorghum and legumes such as cowpeas and mungo beans should be cultivated.

Little fertilizer is used and animal manure is generally collected and dried for use as fuel. With the expanding cultivation of crops such as cotton, the use of fertilizer is becoming more urgent. There is need for soil analysis and extensive experimentation to ascertain the fertilizer requirement and the effect of fertilizer on

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241 [387] yields. As will be indicated later, inorganic fertilizers could probably be produced cheaply in Iraq and organic fertilizers could be produced as by-products of the slaughtering industry.

231 4. Livestock Improvement

The productivity of livestock is extremely low, primarily because of inadequate feed supply. In addition to the production of fodder crops, measures should be taken to improve natural pasture lands, particularly in the northern mountains, which have generally suffered from over-grazing. Reseeding and rotational grazing are necessary. Productivity could be further raised by the establishment of shelters, better breeding methods, especially the introduction of new and improved sires and maintenance of stud stations, and by more effective control of parasitic diseases through an increase in the number of veterinarians and the provision of more extensive diagnostic facilities in the provinces.

The quality of livestock products could be raised considerably by a number of measures. One of these is an improvement in the practices and more stringent sanitary supervision of abattoirs. Others would be the establishment of a number of wool shearing and grading units under the guidance of an appropriate expert; appointment of a hides and skins expert to serve as general manager of the newly established Hides and Skins Association; and recruitment of an abattoir specialist to train local abattoir supervisors in improved methods of flaying and preserving hides and skins.

234 At present, even the major cities are without a clean, safe milk supply. The supply of milk could be substantially improved by better feeding of livestock, concentration of milking cattle in well-equipped settlements on the outskirts of cities, and central collection, transportation and processing of milk under strict sanitary controls. The possibility of cooperative collection and processing of milk should be explored.

231 [233] Since the nomads and semi-nomads, who may number from 200,000 to 500,000, account for a large proportion of the livestock in the country, particularly sheep and goats, their needs must receive special attention. Measures should be taken, for instance, to provide them with better watering facilities, sheep-dipping stations,

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and trained medical and veterinary assistants to control disease. In the North, livestock shelters would reduce the high mortality in the winter. In the long run, however, livestock raising is likely to become increasingly the preoccupation of settled farmers, particularly as the area under cultivation is gradually extended and natural pastures correspondingly restricted. Mixed farming, in which livestock raising based on the production of fodder crops would have its appropriate place, would greatly enhance incomes, especially because it would give more year-around employment to farmers who now, with the concentration on winter crop production, are underemployed for the greater part of the year.

5. Research and Education: Incentives

While is it relatively easy to point out what should be done to improve agriculture and livestock, devising the means to accomplish the improvement is incomparably more difficult. The means available to the state for a direct attack on low productivity are necessarily limited. The government can, of course, lay out drainage schemes, make more water available, provide facilities for combatting plant and animal diseases and pests, establish livestock shelters, assist in organizing cooperatives, and furnish more ample credit facilities. However, except perhaps in the new settlement areas, the state cannot prescribe better crop rotation, the use of improved seeds, better methods of cultivation and the like. These depend on private initiative which can at best only be stimulated and encouraged by the government. In some circumstances farmers can be relied upon to seize the initiative, as in the case of cotton where high prices have stimulated a rapid expansion of production. In the main, however, greater productivity depends on the success of efforts to persuade large numbers of landowners and cultivators to change their time-hallowed methods and techniques. For this reason principal reliance will have to be placed on education, supported by practical research and supplemented where feasible by financial incentives provided by the government.

First of all, steps should be initiated immediately to organize an effective extension or advisory service to farmers. At present the Department of Agriculture has less than 25 qualified agriculturists capable of research and educational work, and much of their

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242 attention is devoted to administrative and regulatory tasks. The
649 relatively small number of agricultural officers in the provinces are engaged primarily in the distribution of seed, in the collection of rather inadequate statistics and in administrative tasks. They lack the time, the transport facilities, and, often, the ability to counsel farmers on methods of improving their output. While shortages of trained personnel will prevent the immediate establishment of a full-time extension service, the Mission recommends the early appointment of a director of extension and education whose first responsibility would be the recruitment and training of personnel for such a service. The need is for people well-grounded in practi-
[874] cal, general agriculture rather than specialists. The facilities of the secondary agricultural school and the higher agricultural institute at Abu Ghuraib might well be used to train the required people, provided the quality of the staff is improved and the curriculum revised, especially in the direction of giving more practical training in agriculture. It will be impossible, however, to attract properly qualified people to an extension service unless the status of agricultural officers in the provinces is considerably raised and their conditions of service, particularly housing and pay, are greatly improved.

The effectiveness of such an extension service would be greatly enhanced by the organization of demonstration units on strategically located government and private farms. There, farmers could be brought to see with their own eyes the practical advantages of improved methods of raising livestock, poultry and farm crops. At the same time the extension service might work closely with the public schools in the rural areas and small towns to insure that a knowledge of the rudimentary principles of agriculture is instilled in children at an early age. Rural primary and secondary schools should give agriculture an appropriate place in their curriculum.

816 An extension service must be backed up by sound, practical
242 research which will develop new crops and more productive varieties, improved livestock breeds, better methods of cultivation, and more effective control of pests and diseases. At present there are few people engaged in full-time research. Government farms are devoted primarily to the commercial production of seed, serving neither as demonstration farms nor as centers for extensive

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research. The Mission recommends that in the future such farms should be used primarily as experimental stations. Seed for distribution to farmers could be produced on land surplus to the needs of the experimental stations or on a contract basis under appropriate government supervision on private farms. The Mission suggests that immediate steps be taken to secure a research director to coordinate all existing research and to recruit a gradually expanding staff of full-time research experts consisting partly of foreigners and partly of Iraqis. 242 816

These measures will bring about an improvement in agriculture only very gradually. In the short run they will need to be supplemented by positive financial incentives. Most farmers will probably prove unwilling or unable to invest money or time in the cultivation of fodder crops or the use of fertilizers unless they are convinced through practical experience that such an investment is really worthwhile. In order to induce farmers to experiment themselves, the government may wish to consider providing free seed for fodder crops and defraying part of the cost of fertilizer, or, alternatively, making a flat money payment per donum to those undertaking to use fertilizers or grow feed. Such incentives should, of course, be offered only as long as is necessary to demonstrate the value of improved methods. The provision of credit for the acquisition of machinery, fertilizers and other means of production will also be helpful in this respect. 242

It has already been pointed out that the existing sharecropping system, coupled with the shifting nature of cultivation, militates against the introduction of soil-building and forage crops. Under present conditions the landlord will find it difficult to compel the fellah to grow such crops unless the fellah is actually paid for doing so. The Mission therefore suggests that the difficulties inherent in the sharecropping system, as well as the advisability of changes in this system, be studied by an expert on land tenure. 242 427

Tobacco and the Tobacco Monopoly

The Mission has paid special attention to tobacco, not only because cultivation of this crop is of considerable importance to the Kurdish farmers of the North, but also because tobacco leaf is 249 655

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249 handled by a government monopoly, the operations of which have
665 been highly controversial.

The Tobacco Monopoly was established in 1939 in order (1) to improve the quality of tobacco, (2) to assure farmers stable and remunerative prices, and (3) to raise revenue for the government, although this objective was not explicit and was certainly subordinate to the other two. The Monopoly licenses the area which may be planted to tobacco, buys the tobacco produced thereon at fixed prices set each year and resells it to manufacturers at prices more than twice as high as those it pays.

It is generally recognized that the first objective has not been realized, for the quality of tobacco, which was never high, has probably declined still further. Neither the Monopoly nor the Department of Agriculture has had the personnel to assist farmers in improving the varieties or strains of tobacco grown or the methods of cultivating, picking, curing and sorting, all of which leave much to be desired. The Monopoly's rather haphazard and often arbitrary system of grading and its limitation on the amount of tobacco it will buy per licensed donum have discouraged the production of better quality tobacco and the achievement of higher yields. Storage of tobacco in inadequate warehouses contributes further to its deterioration.

The second objective appears to have been at least partly realized, at least insofar as farmers have been given remunerative prices for their tobacco and have received a fairly stable income in the last five years. During the war years farmers enjoyed a bonanza since the Monopoly had no effective limitations on output, classified most of the tobacco in top grades and bought it at very high prices. After the war, changes in grading, stricter limitations on output and lower prices inevitably created discontent, although prices were still remunerative and, until recently, the Monopoly continued to buy more tobacco than the licensed output. The wide disparity between the Monopoly's buying and selling prices has continued, however, to put a premium on the illicit growing and marketing of tobacco. Moreover, the merchant has managed to interpose himself to an increasing extent between the grower and the Monopoly because of his ability to advance money on crops, to transport tobacco to distant collection centers and to obtain a

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higher classification for the tobacco than the grower is often able to get. 249 655

The third objective has undoubtedly been achieved. During the period September 1, 1943 to March 31, 1950 the Monopoly's cash income exceeded its cash expenditures by almost 6.5 million dinars. In fact, contrary to original intentions, revenue would seem to have become the primary objective of the Monopoly.

Improvement in the quality of tobacco should be the primary aim in the future. The Mission therefore suggests that one or two foreign experts, together with a number of Iraqis, be engaged to work in the field in order to help farmers to better their methods of growing, picking, curing and sorting tobacco. At least one expert should be recruited to instruct graders in proper methods of classifying tobacco, and another expert with an Iraqi deputy should be appointed to approve all tobacco for final purchase by the Monopoly. The existing inadequate warehouses should be replaced by four or five new warehouses provided with dust extracting facilities and proper humidifying equipment.

The Mission believes that under existing circumstances the Monopoly should be retained. As long as the tobacco is not of such quality that it can be marketed abroad, there will need to be some agency to limit production. Moreover, in the absence of the Monopoly the large number of small growers would have inadequate bargaining power in the fixing of prices vis-a-vis the merchants and manufacturers. The Mission advises strongly, however, against the proposed extension of the Monopoly to the manufacture of tobacco products. Such a step seems hardly necessary, since manufacturing is generally in competent hands, and it would only divert the Monopoly's attention from the primary task of improving the quality of the tobacco. The Mission suggests that the Monopoly be reorganized as a fiscally autonomous agency within the Ministry of Agriculture recommended elsewhere in the report. The Monopoly should be headed by an Iraqi director-general assisted by an expert adviser and an advisory board which would include representatives of the growers. In order to discourage illicit marketing of tobacco, the difference between the Monopoly's buying and selling prices should be narrowed to an amount sufficient to cover operating costs and depreciation as well as the accumulation

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of a small cash reserve. The resulting loss in revenue can be offset by an increase in the tobacco excises which are relatively easy to collect from the manufacturers. The reduction in illicit production and marketing thus achieved should make it possible to raise the existing limitation on output per donum. This would encourage the better farmers, yet probably would not necessitate a further restriction of the licensed area, which the Mission realizes would be politically impracticable.

The Introduction of Sugar

In view of the government's desire to introduce the cultivation of sugar beets in northern Iraq, this subject has also been given special attention by the Mission. The possibility merits serious consideration because Iraq has imported over the last three years, on the average, 75,000 tons of sugar annually. There is, in addition, a serious need for new crops to diversify production and make more effective use of the manpower on the land. The Mission believes, however, that no decision on the production of sugar should be made until there is reasonable assurance that sugar can be produced at a cost competitive with the landed price of imported sugar (thus exclusive of import duty) and that the farmer will derive an income from sugar at least equal to that obtained from alternative crops, such as cotton, which can be grown on the same land. Moreover, before a decision is made in favor of sugar beets, the superiority of this crop over sugar cane, which could be grown in the South, must have been clearly established.

Sugar beets have been successfully grown in northern Iraq in test plantings carried out by the Department of Agriculture. Larger and more extensive test plantings are necessary, however, particularly to study the problems of insect control, yields and costs. The problems of labor supply and transport also need to be more thoroughly explored. The cultivation, transport and processing of sugar beets require close coordination and therefore careful organization. The production of beets is exacting, requiring considerable skill and labor. While preliminary evidence indicates that, on the basis of current price relationships, the yield per donum of sugar beets and cotton would not be significantly different, the balance of advantage may well prove to be on the side of cotton since, owing

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to the greater amount of labor required for sugar beets, a single family can probably cultivate a larger area in cotton. Up to the present, tests have not found a variety of sugar cane adapted to Iraq, but both the methods and the scale of the experiments have not been adequate enough to prove conclusive. If further experimentation does result in the discovery of a well- adapted variety, the production of cane may be preferable since cane yields are generally higher than beet sugar yields and cane production requires less skill. Moreover, the farmers in Amara in southern Iraq, where cane would be grown, are at least as much in need of a new crop as those in the North.

The Mission therefore believes that further investigation and experimentation over the next few years are required before a sound decision can be reached on the production of sugar. For this purpose it suggests that two experts be engaged to direct further research, one in beet and the other in sugar cane. During the period of experimentation it may also be desirable to invite a leading foreign sugar company, acquainted with the production and processing of both beet and cane, to make a study and recommendations on the best way of organizing the cultivation and processing of sugar.

Production Credit and Marketing

A considerable increase in farm income could ultimately be achieved through the provision of more ample agricultural credit, the establishment of storage facilities for crops and the organization of cooperatives.

The resources of the state-owned Agricultural Bank, the only agricultural credit institution, are insufficient to meet existing needs for credit. In many cases farmers must either borrow money from private lenders at exorbitant rates of interest or sell their crops in advance of the harvest at substantial discounts. Although the Bank has an authorized capital of ID 1,000,000, the government has paid in only ID 550,000 and the Bank has been compelled to borrow ID 300,000 to supplement its slender resources. In November 1949 the Bank was forced to suspend lending except for small amounts and not until a year later was it able to resume credit operations on a modest scale. It is vital that farmers be

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452 453 enabled to obtain sufficient credit to buy seeds, fertilizer, livestock, machinery and other means of production and to make it unnecessary for them to sell their crops immediately after harvest at extremely low prices. The Mission therefore suggests that the Development Board provide sufficient funds to raise the paid-in capital of the Bank to about ID 2,000,000. This should permit the Bank to expand its credit operations and refund its borrowed resources. Action to enable the Bank to increase its lending will be largely ineffective, however, unless at the same time greater care is exercised to insure that loans are promptly repaid and that farmers, who are often improvident, borrow only for purposes which will increase their output. In the past a considerable portion of the Bank's capital has become frozen as the result of repeated extensions of the maturity dates on its loans.

343 488 Good storage facilities for grain and perhaps other crops would reduce losses due to infestation, improve the quality of grain, assist in the stabilization of prices and provide some assurance against famine. At present grain is often stored in the open or in inadequate buildings and sheds. A modern 5,000-ton grain elevator has recently been erected in Baghdad, and another of 40,000 tons is projected for Basra to serve the export trade. There is, however, an urgent need for less elaborate and smaller storage facilities throughout the grain-growing areas. These could be of simple concrete or corrugated steel construction and range in capacity from 1,000 to 3,000 tons. Simple cleaning machinery would be desirable in order to remove impurities from the grain. Such storage facilities, which might have a total capacity of about 75,000 tons, would presumably be owned and operated by the Grain Board, an autonomous government agency, and would need to be closely controlled so that the Agricultural Bank could with safety make loans against grain stored in them by farmers and merchants. Under such conditions, more merchants would probably enter the market to bid for grain at harvest time and farmers themselves would not be under the necessity of marketing their grain immediately after the harvest irrespective of the level of prices.

474 Although an impressive law on cooperatives has been put on the statute books, almost nothing has been done to organize effec-

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tive cooperatives. As already indicated, the producers' cooperative in the Dujaila project is the only promising venture in this field. The organization of cooperatives is at present entrusted to a department in the Ministry of Economics whose entire staff consists of a part-time director, one assistant and one clerk. About forty cooperatives are now registered with the department, but most of these are apparently inoperative and all but one are consumers' cooperatives for which there seems to be less need. The Mission urges that in the future efforts be concentrated on the organization of agricultural cooperatives and that therefore the responsibility for cooperatives be transferred to the Department of Agriculture. Such cooperatives can become an important means of self-help and saving by farmers. Gradually they may become an important vehicle for the extension of credit to small farmers by the Agricultural Bank.

Undoubtedly progress in inculcating farmers with the necessary cooperative spirit and a knowledge of the benefits of cooperation will be slow. Strong guidance and control will need to be provided initially by the government, and the cooperatives will have to be held to strict accountability in the use of their assets. Yet the experience with the Dujaila cooperative and, to some extent, with cooperatives in other Moslem countries, such as Egypt, indicates that beneficial results can be achieved by persistent, well-directed efforts. Cooperatives for the purchase and distribution of seeds, fertilizer and other tools of production and for the joint ownership and operation of machinery should be made an integral part of the new settlement schemes. While primary emphasis should be put on this task, efforts should also be made to organize cooperatives on a small, experimental scale among existing sharecroppers. Such cooperatives, assisted by the Agricultural Bank, might confine themselves initially to relatively modest operations such as the provision of seed and simple tools. Success in this field will depend on the existence of a small cadre of enthusiastic government officials properly trained in the organization and operation of cooperatives. It is therefore suggested that the government take prompt steps to have a number of such officials trained in a country like Cyprus where a well-developed cooperative movement exists.

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Forestry

137 313 In a country where the plains are almost entirely devoid of trees and only the mountain valleys contain a few scattered forests, the importance of forests as a means of controlling erosion and floods and overcoming the acute shortage of timber needs no emphasis. The Mission did not give special attention to this problem because the government has already received an excellent detailed report and recommendations from a British expert. It wishes only ~~to stress~~ that it is important not only to protect and extend the forests in the mountain areas, but also to undertake the planting of trees in the plains to serve as windbreaks and as sources of fuel and building timber. In the Dujaila project an encouraging beginning has been made with the planting of trees along roads and boundaries. In future settlement schemes it might be well to require farmers to plant and maintain small wood lots. To carry out a proper program the Forestry Department, which is now only a division within the Department of Agriculture, should be given an independent status and headed, as at present, by a well-trained foreigner. The training of an adequate number of foresters should also be undertaken.

Establishment of a Ministry of Agriculture

417 Agriculture, livestock-raising and forestry are of such critical importance to Iraq that they merit a separate ministry in the government. The Mission recommends therefore the establishment of a Ministry of Agriculture and Land Use. Within this Ministry and directly under a permanent secretary, it is suggested that directorates-general be organized for each of the following subjects: agriculture and horticulture; animal husbandry; forestry and soil conservation; land settlement; and research. Special sections for administrative and personnel questions, legal affairs, economic research and statistics, and extension and education might form part of the immediate staff of a permanent secretary. Within the Ministry there should also be grouped the more or less autonomous organizations such as the Tobacco Monopoly, the Grain Board, the Agricultural Machinery Administration, the Date Association and the Chambers of Agriculture. The Mission believes that such a ministry would greatly facilitate more effective direction of the government's efforts to improve agriculture and related pursuits.

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III. Industry

Industry is as yet little developed in Iraq. As already indicated, apart from the oil industry which employs about 12,000 people, probably not more than 2,000 are working in modern industrial plants. These plants represent a total capital investment of approximately ID 4,000,000 and an annual gross income of about ID 3,000,000. Industry is largely confined to the processing of agricultural products, the production of building materials such as cement and bricks, and the manufacture of consumers' goods like textiles, soap, matches, cigarettes, shoes and beverages. 433

Conditions, however, are generally favorable to further industrial development. An expanding agriculture should provide more materials, such as fibres and oil seeds, for processing and when the standard of living among the rural population is raised there should be a growing domestic market for industrial products. In oil and natural gas the country possesses a cheap source of power and fuel as well as an important source of raw materials. There are surface indications of iron, copper, zinc and chrome ores, as well as of the existence of sulphur and salt deposits. The extent of such deposits should, however, be confirmed by core drilling before steps are taken to undertake their commercial exploitation. In the cities there is adequate manpower for industry, and the Iraqi workman with proper training is generally adept at learning industrial processes. Skilled manpower, however, is very limited, and, naturally enough, there is little of the technical "know-how" which comes through experience and training. Other limiting factors in industrial development are the lack of sufficient private capital and initiative. Much capital, particularly that accumulated from agriculture, is hoarded and the balance is generally invested in urban or rural property, which is regarded as less risky, or in commerce, where investors anticipate a higher rate of return. While there is a trend toward increased private investment in industry, particularly since the war, industrial development in the immediate future will have to depend very largely upon the initiative or financial assistance of the government. [135] [464] [454]

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The Mission has carefully considered what industries might be expanded and what new industries might be established. It has sought to confine its recommendations for industrial development to those industries where there is reasonable prospect of efficient production, competitive with imports, and where production is within the technical capacity available in Iraq, supplemented, where necessary, by outside technical and managerial assistance.

Petroleum and Refining

No recommendations need be made on the oil industry. The oil resources of Iraq are immense, the reserves of the Kirkuk field amounting reputedly to 1,000 million tons and those of the less well explored fields near Basra offering perhaps equal promise. The development of these resources by the oil companies is proceeding along sound lines. The oil companies have also been well in advance of other enterprises in providing housing, health services, and other amenities for their employees, in instituting labor training schemes and providing better pay for workers. The Mission realizes that there has been some criticism in Iraq of the rate of development, particularly in the Basra field. The expenditure of close to £90,000,000 by the oil companies on oil development in Iraq is now, however, beginning to yield a rapidly rising output. Production in recent years might have been much greater if the outbreak of the war with Israel had not resulted in closing the pipeline to Haifa and in preventing the completion of another pipeline to that city. The existing line has a capacity of 2,000,000 tons and the projected line would have added another 4,000,000 tons. As already indicated, the government has recently obtained a commitment by the oil companies to increase output, which was a little less than 6,000,000 tons in 1950, to 30,000,000 tons per year by the end of 1955. It would not be advantageous to Iraq, however, to have production increased to such levels that the ensuing rise in oil revenues cannot in fact be effectively spent. Oil in the ground is a reserve for the future, and too rapid tapping of this reserve may entail a partial waste of resources.

The government has decided to build a modern oil refinery near Baghdad which it anticipates will cost about £7,000,000. This refinery will use crude oil supplied from the Kirkuk fields at cost. With an annual capacity of 1,000,000 tons, it will be able to supply

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all of Iraq's anticipated requirements for some time. This decision reflects an understandable desire on the part of Iraq to have a modern refinery of its own, replacing the somewhat inadequate and rather old Alwand refinery at Khanaqin which is owned by a subsidiary of the Anglo-Iranian Oil Company and is capable of supplying not quite 70 percent of Iraq's current requirements.[3] Foreign management of the new refinery will probably be necessary, at least for an initial period. The project will make it necessary to close the Alwand refinery and probably also the small oil field near the Iranian border from which it draws its crude. This field probably cannot be developed on a scale large enough to warrant investment in the pipelines necessary to export the oil.

Expansion of Old Industries

Some industries are now expanding without government financial assistance. The cement plant and the brewery are both doubling their capacity. Recent improvements and expansion have put the woolen industry abreast of the country's needs. Other industries do not for the present require expansion. Flour milling capacity, for instance, appears ample. The tanneries also appear to have sufficient capacity, but to raise the quality of their raw material supply, technical assistance is needed to improve methods of flaying and preserving hides.

Still other industries could usefully be expanded but do not have sufficient financial resources to do so without government assistance. The cotton and rayon textile factories in Baghdad and Mosul might well double their designed capacity and extend their facilities to make a wider range of products. At present cotton textile capacity can meet only about a quarter of the country's requirements. Since ample raw material is available and costs of production can become competitive with those abroad, further expansion would appear to be warranted. In its regular budget for 1951-52 the government has provided ID 1,000,000 for a government textile mill. The Mission believes, however, that government ownership and operation would not be desirable and that it would be vastly preferable to extend capacity with the participation of private capital and enterprise.

[3] By an agreement reached in December, 1951, the government took over ownership of the refinery, retaining the AIOC subsidiary provisionally as its operating agent.

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433 Further expansion of the vegetable oil extraction plant would be justified, the more so since increasing quantities of cotton seed will be available for crushing and the existing plant does not meet domestic requirements. Hydrogenation equipment for making cooking fats might also be added, and the capacity of the appurtenant soap plant might be enlarged so as to cover about half of Iraq's needs. The capacity of the country's only modern shoe factory, a small enterprise, might well be tripled to reach an output of about 100,000 pairs per year. Similarly, a plant producing aluminum utensils could well be expanded and complemented by facilities for melting and rolling aluminum scrap and pig, thereby substantially reducing costs of production.

Establishment of New Industries

Among the new industrial enterprises which could be advantageously launched are a jute mill, bonemeal fertilizer plants, an automobile tire factory, a small steel mill, a central machine shop, a concrete batching plant and a plant for the manufacture of date boxes. For all of these there is sufficient demand, and production could take place economically on a small scale. The small steel plant would smelt domestically available scrap and produce in a hand-operated mill such items as reinforcing bars, window frames and small angles. The central machine shop would replace the [392] numerous small shops now engaged primarily in maintaining the 3,000 irrigation pumps in Iraq. This shop would significantly reduce the cost of maintaining pumps and, since these pumps are of relatively simple construction, would also be able to manufacture them. Small bonemeal plants could be built at Mosul, Baghdad and Basra to convert bones and other offal of abattoirs into a valuable fertilizer for domestic use. The growing demand for jute bagging would justify the installation of a jute mill capable of making about 10,000 tons of jute products per year. A small tire plant to manufacture tires under foreign license and with foreign technical assistance might also be feasible in a few years, particularly since the demand for tires has been growing rapidly and the development of road transport is expected to receive considerable impetus in the future. A concrete batching plant with ready-mix trucks would be useful in providing poured concrete for many small construction projects.

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In addition to the above-mentioned enterprises, it may well be desirable to establish a paper mill as soon as there is an assured supply of pulp from abroad. As the demand for paper bagging for domestically produced fertilizers and cement increases, it will probably be more economical to produce such paper in Iraq than to import it. A plant for the manufacture of glass bottles, other containers and tumblers might also be started, provided the availability of the right type of sand can be confirmed.

The largest and perhaps the most promising industrial possibility lies in the utilization of the natural gas produced in conjunction with oil and now almost totally wasted. The Mission recommends therefore that early consideration be given to the erection, near Kirkuk, of a plant which, using natural gas and gypsum as raw materials, would be capable of producing annually 500,000 tons of ammonium sulphate fertilizer, 100,000 tons of elemental sulphur, 10,000 tons of carbon black and 300,000 tons of cement. Since the natural gas contains about 10.5 percent of hydrogen sulphide by volume, it would be worthwhile to establish a plant to recover sulphur from all of the gas produced. Part of the cleaned gas would then be cracked thermally, producing hydrogen after removal of the carbon black. In the most important part of the plant the hydrogen and nitrogen won by removing carbon monoxide and carbon dioxide from the flue gases would be synthesized under high pressure into ammonia. Ammonia and carbon dioxide would then be passed through a slurry of finely ground gypsum, yielding calcium carbonate and ammonium sulphate. The latter would be sold as fertilizer and the former used to make cement. Such a plant could produce fertilizer very cheaply, thereby stimulating its use in Iraq; and any fertilizer not consumed domestically would find a ready market abroad. Sulphur and carbon black could be used in the production of rubber tires in Iraq and would also be in great demand abroad; and there will undoubtedly be a growing demand for cement in Iraq. The plant would cost aproximately ID 25,000,000, of which the sulphur recovery plant would account for about ID 8,750,000 and the cement plant for ID 1,500,000. It should be attempted only if a reliable foreign chemical concern can be interested in designing and erecting it and undertaking its operation under a management contract.

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317 The exploitation of salt deposits may ultimately prove to be another industrial possibility. A salt dome known to exist near Basra might provide large quantities of salt for both export and domestic consumption and might make possible the establishment of an alkali plant, for which the gas from the nearby oil field could furnish cheap power. The Mission therefore suggests that core drilling of this dome be undertaken in order to appraise its commercial possibilities.

433 In the process of industrial development the host of small enterprises which account in the aggregate for a considerable output should not be neglected. Among these are shops engaged in tire retreading, reclamation of lube oil, battery and electrical repair work, automotive and machinery repair, wood-working, etc. Many of them could be assisted to improve their production through installation of power-operated tools and other equipment.

In starting new plants and expanding old ones it is important that capital charges be kept at a minimum by arranging for maximum possible utilization of the installed equipment. This involves the employment of as many shifts as possible, the use of machines at maximum working speed and, above all, the use of purchased power. In the past, industrial plants have added unnecessarily to their capital overhead by installing their own power plants. Such plants usually prove costly since they operate only part of the time. Single plants catering to both industrial and lighting needs are
365 more economical because of a high and steady load factor. In order to induce industries to purchase power, however, the price of electricity for industrial use will need to be reduced. Such a reduction could be achieved in Baghdad, the principal industrial center, particularly if steps were taken to relieve the Baghdad Light and Power Company from the heavy burden of sharing its profits with the Iraq government and also having its profits taxed by the United Kingdom. Elsewhere, such as in Mosul, a reduction in power prices depends on more efficient management.

Financing of Industrial Development

433 471 The Mission believes that complete government ownership of industry should be adopted only where absolutely necessary. In general it will prove necessary only where private capital is not available either because the contemplated investment is too large,

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or because the investment is in a new and untried field which does not for the moment appeal to private capital. For the chemical plant proposed by the Mission the latter would probably be the case. The government apparently is also furnishing all of the capital for the oil refinery. Wherever complete government ownership is considered necessary, it would be desirable to have the Development Board act as the government's agent in putting up the necessary capital.

On the other hand, the existing Industrial Bank should be used as the agency for giving needed assistance to industry in all cases where the need is for expansion of present capacity or where there is a prospect of private participation in establishing new industries. This Bank, which began operations in 1946, has already performed useful work in promoting industry. At the end of February 1951 it had outstanding loans totaling ID 238,650 and participations in industrial enterprises amounting to ID 629,272. It has been handicaped, however, by a shortage of funds, since the government has paid in only ID 600,000 out of an authorized capital of ID 1,000,000. Its resources have to some extent been supplemented by borrowing ID 100,000 and ID 200,000 respectively from the Awqaf Administration and the National Bank. The Mission suggests therefore that the Development Board provide the means for gradually increasing the Bank's capital by about ID 5,000,000 which the Bank would be authorized to use for the making of loans to, and investments in, industry within the framework of an overall program approved by the Development Board.

Aside from making loans for production facilities, the Industrial Bank could assist industry by financing the construction of a bonded warehouse at Baghdad, so that credit could be extended on materials stored therein. The absence of such warehousing facilities has caused a chronic shortage of working capital in most industrial enterprises, for under existing conditions much of their capital is tied up in stocks of supplies.

The Bank's capital should be used primarily as a revolving fund. The Bank should generally dispose of its industrial shares whenever an enterprise becomes profitable and therefore capable of attracting more private capital. Profit-making assets should be kept only to the extent necessary to maintain a reserve against possible

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losses. While the Bank should presumably show a small profit to inspire confidence in its operations, it should not retain its participation in profit-making enterprises for the sake of maximizing its profits, particularly when this limits its ability to assist other industries.

To prepare the Bank for its expanding operations, its staff needs to be strengthened by providing for the appointment of an expert with wide industrial experience to head its Industrial Schemes Section and for the establishment of a small-business branch to pay special attention to the needs of small enterprises. The Bank should, of course, have access to the corps of technical specialists which, at a later point in the report, the Mission recommends should be attached to the Development Board.

Dangers of Excessive Protection

Particular care should be taken that government assistance does not foster inefficient industries at the expense of the country's standard of living. This danger is by no means unreal. A Law for the Encouragement of Industry, originally enacted in 1929 and replaced by a new act in 1950, provides limited but generous exemptions from income and surtaxes and customs duties, and government land free of rent for 10 years. Iraqi-owned industrial enterprises can qualify for these benefits as long as they primarily use raw materials available in Iraq or produce goods imported in considerable quantities. Neither of these conditions is necessarily relevant to efficient production; and it is therefore suggested that the law be amended to stipulate that, in general, such benefits should be accorded only to enterprises which have a reasonable prospect of becoming efficient enough to withstand foreign competition.

Industry is also protected in many cases by high import duties and in some cases, such as cotton yarn, beer and cement, by import prohibitions. In a small country like Iraq, where the limited market affords opportunities for only one or two plants in each field and where the entrepreneurial class is small, there is an acute danger of monopoly and attendant high prices. In Iraq this danger is aggravated by a tendency in some industries to emphasize limited production with high profits per unit rather than mass production with lower unit-profits. While the Mission recognizes the need for

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temporary, moderate protection of certain industries, it wishes to emphasize strongly the need for a rapid and progressive reduction in special assistance.

Government Organization for Industry

Government activities relating to industry, except for the Industrial Bank, are now handled by a Department of Industry in the Ministry of Economics. This Department under its present director concentrates primarily on research and laboratory work and is not equipped to analyze and record the commercial and economic operations of industry. The Mission recommends that a Department of Industries be established to maintain adequate statistical records on industrial production, analyze economic problems relating to industry such as marketing, and administer the laws concerning assistance to industry. The research and technical functions now being carried on would then be continued under a separate Department of Industrial Research and Standards.

These two departments should gradually be equipped to give increasing assistance to industry in improving its output and reducing its cost of production. This type of assistance should be stressed more and more in the future as compared to special measures of protection and assistance which tend to shield industry against competition. Much can be done in the long run to assist industry in better controlling the quality of its products, reducing waste through material salvage, analyzing production costs, making market surveys and increasing labor efficiency through improved lighting, noise abatement, in-plant training programs and better work flow.

Labor and Vocational Education

Finally, it should not be overlooked that a contented, well-trained labor force is of the utmost importance to industrial development. An improvement in working conditions and more attention to the welfare of the worker would tend to increase labor productivity. Such an improvement can to a large extent be brought about only through a growing realization among employers that it is to their own interest. The government should, of course, lay down minimum standards in this respect, particularly since the absence of real trade unions precludes workers from achieving

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greater benefits through collective bargaining. At present, labor laws set up certain requirements with respect to hours of work, periods of rest, vacations, employment of minors and compensation for disability. The Labor Department, however, is inadequately staffed to enforce the law and the many reported violations are generally allowed to go uncorrected. In 1949-50, of 1,228 enterprises inspected, only 136 were found to comply with the law. Of the remainder, 974 were simply warned and 118 cases were referred to courts. It would be desirable to enforce existing legislation before enacting other labor laws. Efforts are apparently being made to survey the possibility of introducing a social insurance system into Iraq. Under existing conditions, however, any social insurance law might tend to remain a dead letter.

Training of labor is impeded by the prevailing illiteracy which makes instruction in writing largely impossible. Elementary schooling and adult education are therefore essential to the improvement of labor efficiency. There is in existence a secondary technical school which attempts to train intermediate school graduates in industry. The curriculum of the school, however, lays too little emphasis on practical training; and the graduates of the school show a disinclination to work with their hands. It would be far better to rely on apprenticeship systems for the basic practical training, and to use the school primarily for supplementary instruction of a somewhat broader character which might be needed by the more highly skilled workers and foremen. Those who are trained in the shop or on the site through such apprenticeship systems can then be recruited from the ranks of the laboring class which is accustomed to manual work. Large private companies and public enterprises like the Iraq Petroleum Company, the railways and the Basra port administration all possess large machine shops where varied training can be imparted to many more than at present. It is suggested, therefore, that the government enlist their cooperation in the training of skilled workers for Iraq's requirements generally.

Commercial and business education is also important. Government, banking and commercial firms, and industrial concerns are all handicapped by a shortage of competent typists, stenographers, clerks, bookkeepers and accountants which has been aggravated by

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the exodus of the Jews. For industry the training of good cost accountants capable of checking the efficiency of various types of operations is especially vital. A single secondary commercial school, supplemented by a night school, and a higher College of Commerce and Economics have been established to meet the need for business training. The first appears to be functioning along sound lines, although it suffers from inadequate quarters and a shortage of teachers. As soon as competent teachers can be trained or recruited, secondary commercial schools should be opened in the other principal cities, particularly Basra and Mosul. On the other hand, the College leaves much to be desired from the standpoint of both the curriculum and the standard of instruction. It apparently produces neither competent and practical bookkeepers and accountants, nor people well-grounded in economics and finance, capable of acting as company secretaries or as economic and financial experts in business or government. Greater emphasis should be placed on practical training; the teaching staff must be strengthened, and more attention paid to banking and accounting, particularly cost accounting. Advisory committees consisting of representatives of leading banks and business houses should be appointed to both the College and the secondary school to review the curriculum, make provision for part-time apprenticeship training and check how well graduates of these institutions measure up to the requirements of business.

IV. Transport and Communications

On the whole, the existing transport system serves the present needs of the country adequately (see map). For the future the principal problems will be to make provision for essential renewals of track and rolling stock and to standardize the gauges on the railways; to develop an adequate network of metalled main roads, supplemented by feeder roads; and to establish effective control over road transport. If these problems are solved, transport capacity should have no difficulty in meeting the growing requirements of agriculture and industry.

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The Port

504 The Port of Basra, an autonomous public agency which also operates the civil airport, is efficiently run and capable of handling a considerable increase in traffic. In view of the adequacy of this port, the Mission sees no justification for the construction of another port at Umm Qasr as has been suggested from time to
503 time. The Port of Basra has been able to finance necessary capital improvements, as well as to pay off its debts, out of current surpluses and should be able to do so in the future except for the task of financing the dredging of a new and urgently needed channel across the Fao bar. The existing channel is subject to heavy silting which necessitates extensive dredging operations at a cost of ID 500,000 to ID 600,000 per year. Until recently it was expected that the Anglo-Iranian Oil Company would advance the funds necessary for this new channel, but recent developments in Iran, coupled with the fact that ample oil revenues will be available to Iraq for investment, appear to make it desirable that the Development Board finance this project.

The Railways

496 The state railways, which are the principal means of transport, are also well managed and have been fully able to meet traffic requirements. They have come in for considerable criticism, however, because of the serious financial difficulties in which they have become involved. The major source of these difficulties lies in the fact that, in 1944, the railways, with the full approval of the government, began a major capital development program without assurance of adequate financing. To defray the cost, the railways have had to use a fund of about ID 2,500,000 set aside for renewals and to borrow ID 1,000,000 from the government as well as £3,000,000 in the United Kingdom with the help of the Export Credits Guaranty Department of the British Government. The program was for the most part soundly conceived and is now largely completed. However, it has left the railways without adequate funds not only for essential renewals but also for other construction pro-
497 jects. One of the major and more controversial projects affected
496 is the erection in Baghdad West of a rather imposing terminal station and railway headquarters together with relocation of railway

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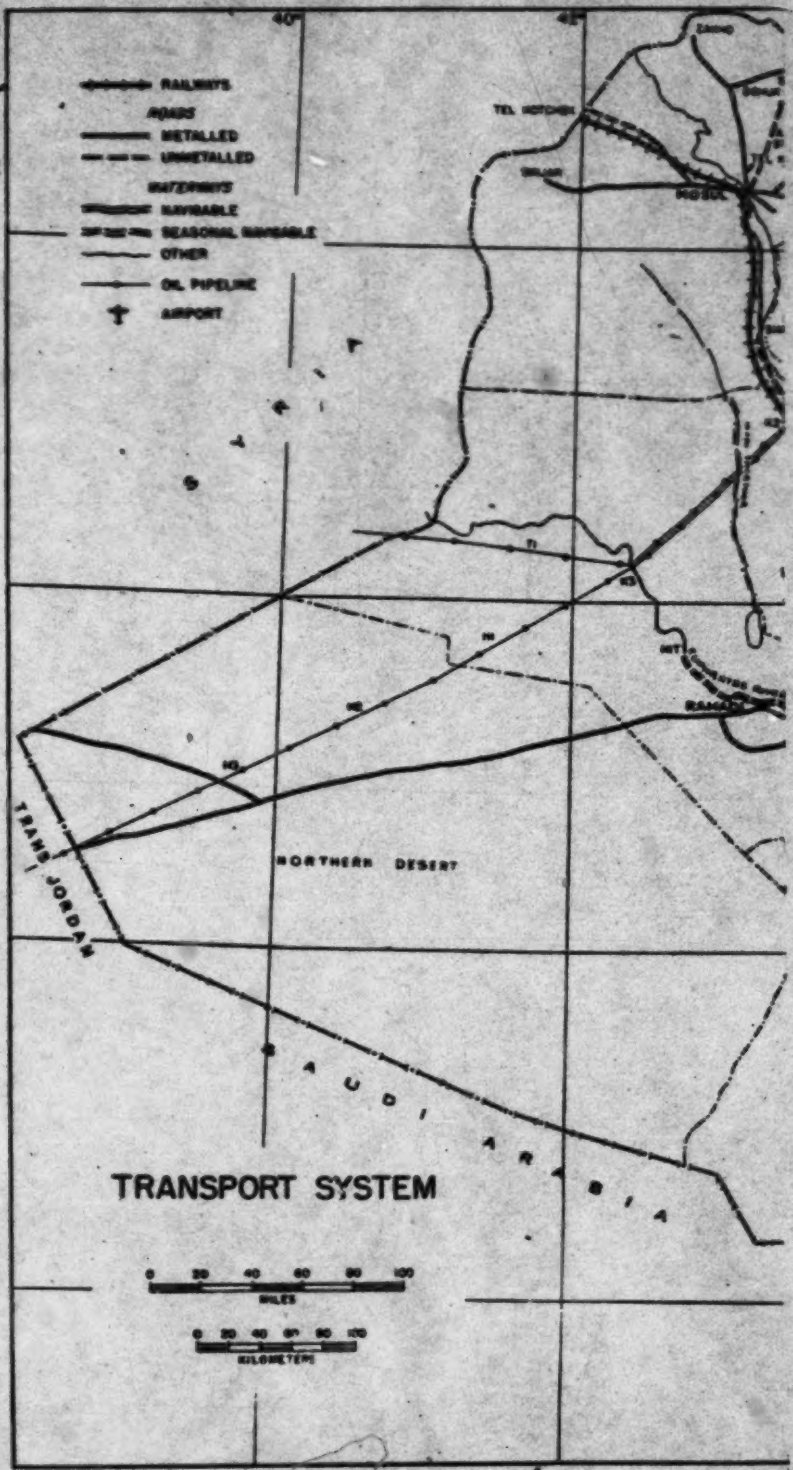

TRANSPORT SYSTEM

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lines and rebuilding and extension of railway goods and marshalling yards. Much of the latter project is really part of Baghdad town planning and its cost should therefore not be completely charged to the railways.

These problems, as well as that of tractive power on the railways, have recently been studied by a British engineering firm. With some modifications, the Mission endorses the conclusions contained in its report. The railways should be enabled to carry out a program involving essential renewals of track and rolling stock, gradual conversion to diesel traction and the completion of the Baghdad-West scheme on a drastically modified basis which would entail finishing the railway station but postponing most of the balance of this project. The Mission suggests, however, some modifications in the British firm's proposals on the latter scheme, the details of which are set forth in the monograph on transportation. The railway station when completed should serve also as the airport terminal and provide offices for the railway administration and the government.

Since the railways can finance only a small portion of this program out of their own resources, the Mission recommends that the Development Board supply the bulk of the required funds. In addition, the Board might take over amortization of the £3,000,000 loan contracted by the government on behalf of railway development. This must be repaid over a six-year period from June 30, 1952.

The Mission also urges that immediate consideration be given to the problem of standardizing the gauges on the railway lines. The Basra-Baghdad-Kirkuk-Erbil line and the branch line to Khanaqin are meter gauge while the line from Baghdad to Mosul, which links Iraq with the railway systems of Syria and Turkey, is standard gauge. The two gauges not only necessitate transshipment, but, above all, make the task of operation complicated and costly. They require a large amount of duplication in activities, of reserves, standbys and spares in all departments. The need for transshipment is likely to be a growing handicap to the railways as traffic requirements increase and the demand for more rapid transport grows.

It is particularly important to consider standardization at this time because the railways face the necessity of carrying out exten-

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496 sive renewals of track and rolling stock and must make decisions as to the type of traction. Final decisions on the Baghdad-West scheme can also be more intelligently taken if the issue of standardization is promptly settled. It is unlikely that such favorable circumstances for an economical conversion operation will ever recur.

Conversion of the meter-gauge lines should not be too costly because the construction gauge, formation and bridges of these lines were originally designed with a view to later conversion to standard gauge. Conversion could probably be accomplished within six years. Meanwhile meter-gauge renewals would be kept to an absolutely indispensable minimum. Within a preparatory five-year period detailed plans and cost estimates would be worked out, necessary standard-gauge track and rolling stock ordered and assembled, and diesel locomotives tested with a view to transfer to diesel traction at the end of the period. The actual conversion operation would take only a few days and could probably be carried out at the end of five years for the Basra-Baghdad line and at the end of another year for the Baghdad-Erbil line. It is possible that the total cost of conversion would not exceed ID 6,000,000. The Mission therefore recommends that the advisability of standardizing gauges, together with a program for such standardization, be promptly studied by the railway staff with the cooperation of outside experts.

Finally, in line with the recommendations of the British engineering firm, the Mission suggests that the services of an expert be obtained to make recommendations on the railway rate structure. A general rate increase of about 12½ percent, with some exceptions, was put into effect in the summer of 1951. This did not affect the rate structure which is characterized by certain anomalous differences in the charges made on various sections of the railway system as well as those imposed on various commodities.

Air Transport and Inland Navigation

508 With respect to air transport, the Mission recommends that the civil airports at Basra and Baghdad be built up to the specifications required by the International Civil Aviation Organization (ICAO) of class B standard airports. This would involve longer runways and improvements in navigational aids, communications

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and meteorological services. At the Baghdad airport it would be desirable to build an entirely new runway and to use a wing of the new railway building as the air terminal. The Port of Basra can finance the necessary work there, but that at Baghdad, costing probably between ID 250,000 and ID 300,000, will presumably have to be financed out of Development Board funds. The Mission has no specific recommendations to make on Iraqi Airways, which assures some internal and international services with a small fleet of four planes, except to suggest that its finances be completely divorced from those of the railways. It is neither logical nor sound financially to require the railways to defray the deficits of the airways. It would be desirable to carry out any future development of the airways in cooperation with other Middle Eastern countries.

Inland water navigation has steadily declined in importance and is now rather insignificant. While irrigation rather than navigation will always be the primary consideration in the use of available water resources, it is possible that the better regulation of the Tigris and Euphrates will ultimately result in some improvement in the navigability of these rivers. Limited but uninterrupted navigation might be insured if the river bed were trained by dams, locks and groynes into a narrow channel at low water and progressively wider channels at higher water levels. The feasibility and cost of such a scheme might ultimately be submitted for study to experts from the Netherlands where similar conditions have long been encountered.

Roads and Road Transport

Road transport has not assumed great importance in the past, primarily because most roads are unsurfaced and impassible for a large part of the year. Even large communities like Kut and Amara, although not situated on railway lines, are not served by all-weather roads. An interdepartmental committee worked out and presented in 1950 a 10-year program for the construction or improvement of 37 main surfaced roads involving a total length of 3,463 kilometers at an aggregate cost of ID 14,500,000. Both the program and the proposed specifications of the roads are sound. In addition, the building or improvement of about 8,000 kilometers of secondary or feeder roads, which do not need to be surfaced, will ultimately

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491 be necessary. Such a program will need to be coordinated particu-
499 larly with the development of new agricultural areas. Earth excavated in the construction of new irrigation and drainage canals can be used in the building of such roads. The surfaced roads should be constructed by contractors of repute capable of furnishing their own road-making plant. It is generally recognized that the Baghdad-Kut-Amara-Basra and the Baghdad-Kirkuk-Erbil-Mosul roads should have first priority. The first of these is at present only a dirt road but the latter has sections which are already surfaced.

494 As road transport develops, it will be vital to institute some controls, particularly since most of the operators now provide only irregular and unreliable service. Limitations on loads and regular inspection of vehicles should be instituted and enforced. Operators of transport services should be licensed to make sure that they are equipped to provide adequate and reliable service at reasonable rates and that they carry insurance.

The Mission has also given some attention to the municipal bus service in Baghdad. Operations at present are seriously handicapped by the diversity and age of its transport equipment and high maintenance costs. A sound decision has been made to standardize equipment. The central workshop should also be modernized and re-equipped and a central garage and four auxiliary garages provided. To carry out this program financial assistance from the Development Board will be necessary. It is also suggested that more efficient management of municipal transport might be achieved through the appointment of a single Director General in place of the present Board, and that a stricter control over the collection of passenger fares be instituted to improve revenues.

Communications

206 For communications, capital outlays will be required primarily in connection with the extension of the telephone system. The needs are well-known in Iraq and do not require elaboration here. Although the communications services are operated at a profit which is credited to the government budget, it is suggested that future capital expenditures be financed by the Development Board. This will not only make it easier to balance the government budget, but will enable the Board to insist on better synchronization of the

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procurement of equipment and the erection of structures to house this equipment. In the past these functions have been carried out by two different sections of the Ministry of Communications and Public Works with little or no coordination.

V. Public Health

Considerable progress in public health has undoubtedly been made over recent decades. The number of hospitals, dispensaries and doctors has greatly increased, and there have been no epidemics of pestilential diseases in recent years. Yet infant mortality is still extremely high—perhaps as much as 250 per 1,000 births; and there is still a very high incidence of such endemic diseases as trachoma, hookworm, bilharzia, malaria and the dysenteries. Many of the prevailing diseases are the by-product of polluted water, and unsanitary, congested living conditions which in turn are traceable largely to poverty and ignorance. Thus an increase in production and standards of living brought about through the general development program will be an important complement to a direct attack upon the health problem through expansion and more effective organization of governmental health services.

The main attack will have to focus on those diseases which sap the vitality and undermine the productivity of the people. In some rural areas, for example, virtually the entire population is at certain times stricken with malaria. Malaria is said to cause 50,000 deaths every year, as well as much sickness and disability which results in great loss for the country. In the provinces of Amara, Muntafiq and Kut the incidence of bilharzia or schistosomiasis, another debilitating disease, is particularly high. The dysenteries and other intestinal ailments are also a prominent cause of low vitality. In 1948 no less than 5,656,474 visits to medical institutions for treatment were reported, and 1,291,225 cases of infectious diseases were treated. Of these, 603,698 were malaria, and 524,740 trachoma. These statistics are of twofold significance. On the one hand, they illustrate the great expansion which has taken place in facilities for treatment of disease. On the other hand, they indicate clearly the relative inadequacy of efforts to prevent disease. It is

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164 therefore vitally important that more attention be devoted in the future to the preventive aspects of public health work.

Prevention of Disease

744 751 Many measures could be taken to strengthen the preventive aspect of public health work. Doctors and nurses must, above all, be imbued with its importance, for they have countless opportunities to impress on their patients the need for proper hygiene and sanitation. Thus social medicine, involving the study of the environmental factors bearing on health and of appropriate measures for the prevention of disease, should be taught as part of the qualifying course in the medical school at Baghdad. Far more emphasis also needs to be placed on the teaching of hygiene in elementary and secondary schools. Children should be taught not only good personal habits, but also the importance of sanitation in and around the home. Special classes might be given in the prevention of the main endemic diseases, by the school medical officer whenever possible. Health education must likewise be given an important place in the curriculum of teachers' training colleges and special courses in the prevention of diseases associated with irrigation and cultivation should be provided in the School of Agriculture and the School of Engineering. Hospitals should be an object lesson in hygiene and every effort made to impress on patients the importance of personal and domestic hygiene. The interest of adults in public health can be stimulated by visual education and by organizing "health weeks", the first of which was held in Diwaniya with conspicuous success during the Mission's stay. The army and police have an excellent opportunity to teach habits conducive to good health. Prospective farmers for new settlement projects should be medically examined to restrict, as far as possible, the introduction of endemic diseases into these settlements. To prevent water pollution it would be desirable to locate villages in such settlements away from irrigation canals wherever possible.

743 759 The Mission strongly recommends that the number of village dispensaries, which is now over 400, be gradually increased and that they be equipped to serve as public health centers. Such centers would be simple in function, aimed primarily at providing elementary medical and health assistance to as many people as possi-

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ble. As conditions permit, the scope of their services could be expanded. At the present stage it will usually be sufficient to have a specially trained medical assistant rather than a doctor in charge. At present there is no separate cadre of medical assistants. It is therefore suggested that the existing School for Health Officials be converted into a training school for such assistants or aides. The medical assistant in charge of a dispensary will need to consider himself as the village sanitation officer and enlist the help of the village elder in organizing a cooperative effort to keep the village clean. He will also need the assistance of a village midwife and, at a later stage, of a public health nurse. The traditional midwife, if properly trained, could have great influence in improving the standards of personal and domestic hygiene, in combatting infant mortality and giving simple advice on the care of infants. Such midwives, when drawn from the ranks of the people whom they will serve, will have a ready entry into homes and will be able to speak in terms which will be readily understood. It is therefore recommended that a school for training such midwives, recruited from the villages, be established. A similar school should be set up for town midwives. It would be desirable to have three foreign midwives appointed to direct this training program.

In the cities a considerable improvement in sanitation could be effected through the creation of a sanitary corps. Such a corps should be charged with house-to-house inspection to detect health nuisances and prevent fly and mosquito breeding, with the inspection of eating-houses, foodstuffs and food handlers, and with the improvement of environmental hygiene in general. A foreign public health or sanitary engineer would be required to organize this service and establish the facilities and courses for training appropriate numbers of sanitary overseers and sanitary inspectors who, in turn, would impart the necessary instruction to the house-to-house inspectors.

The prevention of hookworm, malaria and bilharzia warrants special attention. These diseases are widely prevalent and through their general debilitating effects materially lower productivity. The incidence of hookworm would be reduced by improvements in sewage disposal, the closing of open drains, provision of suitable latrines and the wearing of shoes. Bilharzia, which is transmitted

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by a snail living in irrigation canals, can be combatted by elimination of stagnant, polluted water in which the snail thrives and by treating canals twice yearly with copper sulphate. DDT spraying and the elimination of stagnant water assist in the reduction of malaria. In order to combat both malaria and bilharzia, major irrigation canals should be designed so as to maintain a rate of water flow no less than three miles per hour, and minor distributory canals so as to insure rapid drying-out after use. It is important that one complete "dry-out" per week be enforced in every section under irrigated cultivation.

Knowledge of such methods of combatting disease is already available in Iraq. What is needed is wider dissemination of the knowledge and a vigorous campaign to give it effect. The Endemic Diseases Institute in Iraq has done much useful work in this field but it has been handicapped by insufficient transport, supplies and technical personnel. In the future there will be no justification for denying the Institute adequate funds for its work. It would be well to organize special campaigns in those provinces or districts where the incidence of a particular endemic disease has been especially high. Such a campaign would involve a simultaneous effort to treat the people already afflicted in the locality and to teach local officials and the local inhabitants in general the appropriate preventive measures. Mobile dispensaries and mobile vans equipped to show educational films would be especially useful for this purpose.

Curative Services

On the curative side, principal emphasis must first be placed on the improvement of existing hospitals and an expansion in the nursing service. In its five-year program the Development Board has allotted ID 3,800,000 for medical service buildings. The Mission believes that a large part of this sum should be used to modernize, extend or replace existing hospitals and improve their facilities for diagnosis and treatment rather than to construct additional hospitals. In the monograph on public health the Mission has listed the most urgent projects of this kind which it suggests should be undertaken in adition to those for which provision was made in the first annual budget of the Development Board. While the number

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of hospitals may eventually have to be increased, it is of greater importance today to build more dispensaries. 743

Improvements in hospital administration are also desirable. As long as hospital administration remains in the hands of doctors, they should be given a course in this subject after qualifying.

There is at present one doctor to every 7,000 in the population. With increased accommodations and laboratory facilities at the medical schools, the number of doctors qualifying annually can be increased from 35 to 80. While low, the number of doctors is not seriously inadequate provided they are well distributed and supplemented by sufficient well-trained medical auxiliaries. A large number are concentrated in Baghdad, however, and there is an excessive trend toward specialization. Far more general practitioners are needed in the provinces, but it is clear that better housing accommodations and higher pay will be necessary to attract them. 759

Among the medical auxiliaries the most serious shortage is that of qualified nurses. In one hospital, for instance, it was noted that there were only 12 trained nurses as compared with 21 doctors. The Mission recommends that a school for practical nurses be established in each province, beginning with Basra, Mosul and the Karkh hospital in Baghdad province. It would also be desirable to set up local schools for male "dressers" who are now largely self-taught. With proper training dressers can relieve nurses of many of their duties. The Mission suggests that two foreign nursing sisters be employed in each province to supervise nursing and give instruction, and that the staff at the Royal Hospital in Baghdad be strengthened by the addition of five more foreign nursing sisters. At present Moslem women are not attracted to nursing. The employment of more foreign nurses may help to demonstrate that nursing is a highly respected, skilled profession abroad. More women might also be inclined to adopt a nursing career if nurses were provided with better housing and given status comparable to that of school teachers.

Aside from nurses and dressers, hospitals lack enough well-trained laboratory assistants, radiographers, storekeepers, physiotherapists and operating room attendants. Special courses should be instituted to train personnel in each of these categories. Refer-

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759 ence has already been made to the importance of special training for medical assistants who will generally be in charge of village dispensaries.

278 Many people will continue to be far removed from hospitals, dispensaries and pharmacies. For these it is important to make available such simple "household remedies" as anti-malarial drugs, aspirin, tincture of iodine, DDT powder and Epsom salts. It is suggested that the government make arrangements to supply through village shops such drugs in suitable packets carrying simple directions for use. The general availability of these remedies at a reasonable price will also help to reduce the large number of visits to dispensaries for comparatively trivial ailments.

Organization of Public Health Administration

744 The measures outlined above require a number of changes in
647 the administration of the public health program. The present organization, which is the responsibility of the Ministry of Social Affairs, does not lend itself to an effective attack on the problem of disease prevention. Like most of the other central administrations, it suffers from excessive centralization. There is too little contact with other ministries whose activities are of importance to public health. The Mission suggests that a public health administrator, together with an epidemiologist and a sanitary expert, be recruited abroad to advise the Minister on the organization and further development of the health services. The epidemiologist would concentrate on the principal endemic diseases and the sanitary expert would advise on measures to improve sanitation and environmental hygiene. While a detailed reorganization should await their advice, it would seem best to group health services according to two main divisions, one concerned with the curative, the other with the preventive services.

In the future the reorganized health services will need to work much more closely with the departments concerned with irrigation and agriculture and, on the problem of health education, with the Ministry of Education. In carrying out a much needed decentralization considerable responsibility must, above all, be placed on the chief medical officer in every province. This officer, who now also carries on a private practice, should be given more adequate pay so

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that he can devote his full time to public health work. It will also be important to provide both the provincial and district medical officers with sufficient transportation to enable them to discharge their duties.

VI. Community Planning and Facilities

In the past, communities have unavoidably grown up rather haphazardly. The older parts of the cities are characterized by great congestion, narrow and winding streets, open drains and generally unsanitary living conditions. Livestock are frequently kept in buildings and backyards of major cities. Overcrowding has been greatly aggravated by the influx of people from the land seeking to escape the hard conditions of life in the rural areas and to find opportunities for employment in the cities. Many of these have simply squatted on vacant lots and on the outskirts of cities; they live in primitive, poorly constructed mud and mat huts under conditions of great squalor and without sanitary facilities. Baghdad has about 60,000 of these so-called *sarifa* dwellers and Basra probably no less than 20,000. In each case most of them have immigrated from the province of Amara where problems of land tenure and the silting and salting of land have made conditions of life unusually difficult. Sewage systems are lacking in all of the cities.

Villages are generally clusters of mud houses where, in many cases, men and livestock are not segregated. They have usually grown up around wells or along streams and irrigation canals under conditions where water pollution becomes inevitable. For the most part, safe water supplies are not available. The current flight from the land cannot be arrested as long as the ordinary village lacks the most elementary facilities of sanitation, medical aid, clean drinking water, and schooling, and generally offers little attraction to the person who wants to improve his lot and enjoy a reasonably comfortable life.

Dwellings of mud and mats are not of themselves undesirable. They have the advantage of cheapness and, when properly constructed, are well adapted to climatic conditions in Iraq. Often,

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362 however, they are poorly built and too small; and they are crowded
342 together on sites and under conditions which breed disease.

Need for Community Planning

321 In recent decades there has been a growing awareness of the need for community planning, better housing and community facilities. With respect to villages, little has as yet been done except for the planned development of the Dujaila project. Here some effort was made to have houses erected according to standard specifications and to depart from the village-type of settlement by requiring that houses be erected in groups of four on the adjoining corners of four land allotments. As an aid to town and city planning there has been created within the Department of Municipalities of the Ministry of Interior a small planning section to provide "technical advice as regards municipal schemes for the organization and planning of cities and towns in accordance with modern principles". The municipalities themselves have been charged with "the division of the town into areas having regard to its development capacity and the specifications of plans to be followed for the improvement of streets, public places and buildings in such areas". The final responsibility for planning has, however, remained unclear. The surveys, plans and partial plans have generally been hastily drawn and with little regard for the actual conditions prevailing in the community. In any event, municipalities have for the most part continued to develop without reference to any plans. In many towns new streets have been arbitrarily cut through residential and commercial districts with little concern for real needs or for the people affected. The various ministries concerned with the erection of schools, hospitals, public buildings and bridges generally locate their projects without reference to an overall plan and without consultation with each other.

361 There is today a real need for integrated community planning.
647 The Mission believes that it would be desirable to work towards the establishment of a genuine Community Planning Office in the Ministry of Interior. Such an office should ultimately be staffed with an adequate number of experts versed in architecture, engineering and other aspects of town planning. The first step might be to strengthen the existing planning section in the Department of

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Municipalities by appointing a capable, experienced town planner as director and giving him authority to build up a trained staff gradually. It could serve both the Development Board and local authorities in coordinating development projects on the community level and in ascertaining whether the projects for schools, hospitals, and similar facilities in any given community are properly related to the needs and facilties of neighboring communities.

Housing Developments

Public and quasi-public housing has received increased attention in recent years. The Ministry of Social Affairs, which is authorized to construct houses for workers, has built 204 units and has 185 units under construction. The low rentals on completed units constitute a definite subsidy to the occupants. The city of Basra is now building 750 low-cost houses in accordance with a plan that unfortunately was hastily and inexpertly prepared. Probably the best municipal housing project is near the old city of Bedra in Kut province where a new town site is being developed. The Railway Administration has provided housing for more than 2,400 of its employees, and the Port of Basra is also building accommodations, primarily for its junior officials.

Laws which require the construction of houses by industrial firms and large landowners have remained unenforced. Industrial housing is still little developed. The outstanding project of this kind is at Kirkuk where the Iraq Petroleum Company has been building a large housing development, consisting of 1,028 units, for its skilled artisans and officials. The cost of this project is such, however, that it is unlikely to be widely copied.

Most of the public and quasi-public housing is open to criticism on several counts. Use of poor materials, improper spacing and orientation, poor planning and site engineering have characterized some of these projects. The few public housing projects undertaken have been launched without adequate attention to the problem of how much rent the potential occupants could pay.

Establishment of a Housing Authority

In the light of these considerations, the Mission suggests that the responsibility for planning and supervising housing be entrusted ultimately to a Housing Authority located in the Ministry of Social

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Affairs and staffed by men trained in house design, architecture, site and sanitary engineering, public health, housing and land economics, and project management. Initially a nucleus for such an Authority might be created by strengthening the existing housing section of the Department of Labor. At present the section is staffed only by one part-time architect with one part-time assistant, a superintendent, and a few clerks and accountants. The Authority should be provided with a Housing Fund to which the Development Board would allocate money set aside for housing and into which the proceeds of rentals would be paid. Maintenance and repairs could thus be financed without constant resort to the Treasury.

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The Authority should be complemented by the establishment of an Applied Building Research Station attached to the proposed Department of Industrial Research and Standards in the Ministry of Economics. Such a station would conduct research designed to develop improved methods and techniques for low-cost housing. In particular, it would experiment with the most economical and effective combination of locally available materials and try them in actual housing units. It would test, for example, such possibilities as the utilization of date-palm fronds for the manufacture of pressed boards, of rice husk and asphalt mixed and pressed into blocks or bricks for interior partitions, and of reed mats and bitumen to form waterproof sheets for roofing materials.

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How much public housing should be undertaken is difficult to determine in the absence of sample surveys to ascertain the needs of different parts of the population, particularly in the light of what they can afford to pay for housing. Housing will, of course, automatically improve as the productivity and the incomes of the people rise, but this does not mean that some portion of the revenue from increased production of oil should not be used to provide housing for those in urgent need. Pending a more thorough study, an amount of about ID 400,000 annually might be taken as a provisional target for expenditures. Presumably public housing should cater primarily to the needs of low-paid employees and industrial workers. While a large public housing program is not a matter of high priority at present, it is vitally important that adequate accom-

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modations be built for government officials in the provinces in order to make living conditions attractive enough for capable men.

Self-help in Housing

Any housing program under present conditions should lay primary stress on the encouragement of self-help measures. The great majority of the *sarifa* dwellers, for example, could probably not afford to live in houses built by the state unless really large subsidies were provided, which the Mission does not recommend. These people can best be assisted by setting aside suitable tracts of land for their resettlement and encouraging them to build their own houses of mud and other readily available materials in accordance with models provided by the government. To insure proper siting of structures the government might assist in staking out the foundations and in providing some of the needed materials such as cement for stabilizing the mud floor. As an incentive toward completion, it might also furnish one of the final elements of the self-built house such as the roof or roof timbers or window frames. A project of this kind is particularly needed for the *sarifa* dwellers of Baghdad. The site of such a project should be well-drained, provided with safe water, sanitary facilities, a school, market and health center and located not too far from places of employment. The government actually started a project of this type but it was unfortunately abandoned.

Similar self-help measures are contemplated in connection with the new land settlement schemes. Here the government has a unique opportunity for new forms of community planning. The Mission has for this purpose developed a suggested pattern which seeks to combine most effectively the features to be desired in such a community. Details of this are set forth in the monograph on community planning. Self-help measures can, of course, also be stimulated in existing villages and small towns, particularly in the direction of constructing public latrines and baths, erecting needed community centers and planting shade trees.

Another means of assisting self-help would be the provision of an adequate system of mortgage credit. Private building has always been handicapped by the lack of credit available on reasonable terms. At the end of 1950 the total mortgages outstanding

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452 probably amounted to only ID 2,300,000 of which about 70 percent represented urban mortgages. Of the latter the greater part probably consisted of mortgages on buildings other than houses.

[452] At the beginning of 1950 a government Mortgage Bank began operations. Only ID 100,000 of an authorized capital of ID 1,000,000 has, however, been paid in; and the Bank has had to supplement its resources by borrowing. Moreover, it can make loans only for a maximum of four years and up to ID 2,000. To facilitate an expansion of its operations, the Mission suggests that the Development Board provide funds sufficient to increase its actual capital to about ID 1,500,000 and that the Bank be authorized to extend the duration of its mortgages to at least 15 years where warranted.

344 The Mission has given no special attention to the need for public buildings for which the Development Board has budgeted ID 3,350,000 in its five-year program. Undoubtedly the construction of new buildings for the accommodation of government offices is in certain cases desirable, for existing government buildings are for the most part scattered, overcrowded, poorly lighted and equipped and therefore not conducive to working efficiency. As already indicated, the new railway building in Baghdad should provide some space for government offices.

Water and Electricity Supply

364 365 With respect to community facilities, the most urgent tasks appear to be the installation of sewage systems for the major cities, and the provision of safe water supplies and electricity.

It is suggested that a start be made with a sewage system in Baghdad, since the rising level of the subsoil waters makes the need of this city most acute. A plan for such a system has already been prepared by consultants to the government. The initial step might be to carry it out for that portion of the city on the east bank of the Tigris. It would be useless, however, to proceed unless there is a determination to make connections with the system compulsory for all property owners who are supplied with municipal water.

A safe water supply is, as was pointed out earlier, one of the keys to the health problem. While a number of cities and towns now have a reasonably safe water supply, the situation in the great

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majority needs substantial improvement. The Department of Municipalities has drawn up a five-year program to provide or extend water supply systems for 114 municipalities with a total population of 943,000 people. Since such water systems are technically simple and the need is great, the Mission suggests that the Department be authorized to proceed with this program. Water supply systems for villages must, of course, be simple and inexpensive. In some cases, wells may prove to be the solution, although frequently brackish water is encountered; in other cases, water piped from a stream or canal with the help of a small pump and run through simple filters may be possible.

Outside of Baghdad and Basra municipal power plants are generally inadequate, and a considerable number of municipalities with a total population of 175,000 have no electricity at all. Baghdad and Basra, which together account for a generating capacity of 51,000 kilowatts, have a sufficient supply; and Kirkuk is adequately supplied from the large power plant of the Iraq Petroleum Company. Total generating capacity available in the remaining municipalities, however, is only 14,000 kw. A program for the expansion of this capacity and the provision of electricity for all municipalities would involve the installation of generators with an aggregate capacity of 10,000 kw. It would be desirable to proceed with such a program, provided simultaneous steps were taken to improve the management of municipally-owned power plants outside Baghdad and Basra. In these two cities the power plants are owned and managed efficiently by a private company and the Port respectively. At present the machinery in the plants of other municipalities is poorly maintained and little or no attention is paid to depreciation. Power "losses" are as high as 36 percent compared to not more than eight percent in Baghdad and Basra; and the rates charged range from 30 to 55 fils[4] per kw-hr as contrasted with 18 fils and less in Baghdad and Basra. To remedy these evident deficiencies it is recommended that serious consideration be given to entrusting the management of such plants to a competent private firm like the Baghdad Light and Power Company.

The Mission does not believe that it would be economic to develop hydroelectric power at present. The capital cost of hydro-

[4] One dinar equals one thousand fils.

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electric plants is considerably greater than that of equivalent thermal capacity; and Iraq possesses very cheap fuel for the generation of power. At present municipal power is used primarily for lighting, and even if industrial plants should turn increasingly to municipal stations for their power supply they would be able to obtain considerable amounts of "off-peak" power in such cities as Baghdad and Basra without any increase in generating capacity. In the judgment of the Mission hydroelectric power should be considered only if it does not need to be transmitted over long distances and then only if the demand is such as to insure a steady and high load factor. It is not yet clear that the Wadi Tharthar depression will actually store enough water to permit the generation of power, and the power which might be generated at the dams projected elsewhere is likely to be too far removed from major consuming centers.

VII. Education

Education is a basic condition for the agricultural, industrial and technological progress of the country as well as for the development of a fuller cultural life and the sound growth of democratic institutions. Its importance has received growing recognition and considerable progress has been made. In years of financial stringency the budget for education has usually continued to expand while other government expenditures were curtailed. In the last two decades, the number of schools rose from 262 to 1,100, the number of pupils from 32,750 to 175,000 and the number of primary school teachers increased from 1,325 to 6,588. During the same period, expenditures on education rose from about ID 300,000 per year to well over ID 4,000,000—a not inconsiderable advance even after taking into account the rise in prices.

Nevertheless, there are still only 175,000 children in schools out of about 750,000 of school age. Despite the increased emphasis on primary education, expenditures for this purpose still take only 51 percent of the education budget. The number of children in school declines sharply with each succeeding grade, so that only about half the children starting in primary school actually finish their

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primary school education and much of the investment in their education accordingly bears little fruit. The facilities and quality of technical or vocational education are seriously deficient and adult education has been almost wholly neglected. Probably about 80 percent of the men and over 95 percent of the women remain illiterate. Moreover, educational concepts are far too narrow and too little related to the everyday problems of living.

As the result of its study of educational needs the Mission has come to the conclusion that the government should launch a three-part program involving (1) the improvement and extension of technical education, (2) the gradual introduction of compulsory primary school education, and (3) fundamental education for adults.

Technical Schooling

The question of technical or vocational education is not treated in detail here, partly because it has already been discussed in connection with agriculture and industry, partly because the government has requested UNESCO to send a special mission on vocational education. Although the number of students in technical schools—about 750—seems very inadequate, Iraq apparently has had difficulty in absorbing the graduates of these institutions largely because they lack sufficient practical training and they show a distaste for manual work. Obviously one of the first steps toward improved technical training will be to give the curriculum of the intermediate and secondary schools a greater vocational bias, with emphasis upon the dignity and value of manual labor. It is also worth emphasizing again that skilled labor and foremen can best be recruited from the ranks of active young workmen through on-the-job training programs, supplemented in some cases by technical schooling. Only the higher supervisory grades of personnel need to be trained in technical schools, and even for these there should be considerable emphasis on practical training in business, industry and agriculture as an integral part of the curriculum.

Introduction of Compulsory Primary Education

There is a general consensus both among Iraqi educators and foreign experts who have examined the problem that the time has come for a broad advance in the direction of compulsory education.

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871 In India, where conditions are not dissimilar, a program for the gradual introduction of compulsory primary education has been approved. The only real question relates to the speed with which the objective should be accomplished. The Mission believes that a phased program covering a period of about 15 years may be feasible for Iraq. During the first five years of this period it would be necessary to establish and open the additional training colleges required for teachers, build the needed elementary schools and make all the essential administrative and organizational preparations. At the same time a comprehensive campaign to enlist public support of the objective would have to be launched and a careful survey made to determine the facilities needed in each locality and the order of priority in the introduction of compulsory education. The ensuing 10-year period would then be used for the progressive application of the principle of compulsory education.

875 It is estimated that from 18,000 to 20,000 new teachers will be required for this program. Urgent attention would therefore have to be given in the next three years to the establishment of new training colleges, probably one in each province, to insure that the first group of new teachers would be available by 1956. It is vitally important that competent young men and women imbued with enthusiasm and a sense of mission be attracted to the teaching profession. The local teacher should be equipped to work among adults as well as children and capable of becoming a leader in the community. The status and dignity of the teaching profession should therefore be raised and adequate provision made for teachers' compensation, as well as their housing, health and general welfare.

872 The number of schools will have to be greatly expanded. Moreover, many of the schools are now ill-housed and ill-equipped and will therefore need to be replaced. Many others are in inadequate rented structures. It is noted that the Development Board has already set aside almost four million dinars for school construction in its five-year program. The basis for this figure is not known to the Mission, but, since a considerable part of the program is evidently intended for the replacement of old and rented buildings, it is likely to fall somewhat short of the requirements set by

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a program for the introduction of compulsory primary education over the next 15 years. 872

The introduction of compulsory primary schooling will have to take into account varying economic conditions. It is often argued that most parents are unable to afford to send their children to school because children must go to work at an early age to help support the family. The high proportion of children who leave primary schools before finishing appears to support this thesis. However, these economic pressures will tend to diminish as the development program gets under way and opens up larger and more remunerative oportunities for employment to adults. Experience indicates that one of the first desires of parents who have improved their economic status is to provide better education for their children. Such a desire, for example, has already become manifest among the settlers in the Dujaila project. This does not mean, of course, that economic limitations must be ignored. It would be best to apply the principle of compulsion first in cities and more prosperous communities where economic pressures for the employment of children are least evident. In rural areas there may well be resistance to compulsory school attendance unless the period of schooling is adjusted to permit the help of children in the sowing and harvesting seasons. Some discretion should be permitted in adjusting school vacations to the harvesting periods in different parts of the country; and where schools need to remain open during busy agricultural seasons, the period of instruction should be so scheduled as to permit children to work part of the day in the fields.

Special problems must be met in connection with the education of the children of nomadic tribes. Here teachers trained from the ranks of the nomads themselves will have to travel with the tribes. The teaching syllabus will need to be adapted and simplified in order to take into account their special needs.

Revisions of the School Curriculum

As part of the program there should be a marked reorientation of the curriculum and methods of teaching. Learning is largely by rote. The children passively absorb information and learn comparatively little by actually doing things. Almost no 876 871

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attempt is made to develop their creative instincts. The curriculum is far too bookish and academic and there is a great gulf between what is taught in school and the exigencies of practical life. Dr. Fadhel Jamali, a distinguished Iraqi educator and political figure, has aptly remarked that "no educational system is justified that does not give relief from the scourge of diseases nor aim at raising the standard of living and inculcating new ideas and techniques".

The school curriculum should be revised in the light of four principal objectives which have been well-stated by Mr. Victor Clark in his report on Compulsory Education in Iraq:

> "The first is the need for sound character training, including a realization that education is not simply a collection of skills and aids in preparation for a government or clerical job, but the acquisition of sound values which need to be applied in all walks of life whether professional or manual. The second important need is a knowledge of the practice and principles of good husbandry by those who work on the land. An equally important requirement in a minority of the population is the acquisition of technical skills necessary in local industries and in the growing demand for maintenance work. Finally, as is to be expected in a young country which is still engaged in the process of welding diverse racial and religious groups into conscious nationhood, it is considered that one of the most important needs is the promotion of knowledge and qualities necessary to the furtherance of national unity."[5]

Although there has been some demand that education in the villages should be given a "rural" bias and education in the cities a "vocational" bias, only half-hearted experiments in that direction have actually been carried out. In the future there should be much more emphasis on crafts in all schools. Properly guided children, who are naturally creative, will find joy in working skillfully with their hands and develop a pride in craftsmanship which has seriously declined in Iraq. The crafts which are taught should be as varied and as closely linked to local occupations as possible. Rural schools, in particular, should have small gardening plots where children can learn simple agricultural processes, the care of live-

[5] Victor Clark, *Compulsory Education in Iraq* (UNESCO, 1951), p. 18.

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stock and the use of tools. Crafts should emphasize the best use of cheap local materials in weaving and rug making, woodwork, simple building operations and the like. Urban schools might stress such crafts as leather work, woodwork, bookbinding and printing, brick-making, textiles, etc. For girls, lessons might be provided in sewing, cooking and other domestic pursuits. For all pupils, visits to hospitals, industrial plants, demonstration farms and the like would prove a useful supplement to training acquired at school. 871

As already indicated, health and hygiene should be given a more important place in the curriculum. Children could not only be taught useful facts regarding the causes and methods of treatment of endemic diseases like bilharzia, hookworm, malaria and eye infections, but could be persuaded to do something about them by helping to eliminate stagnant pools and showing others how to avoid water pollution. Similarly they could learn something about the qualities of different foods, the importance of personal hygiene and the value of cleanliness in the home. 871 751

In this type of educational program it would be desirable to enlist the cooperation of officials dealing with health, agriculture and local government problems. Through the children, more effective contacts with the parents would be established. Parents would learn to appreciate the practical value of education to their children and themselves, and a better link between school and community would be forged.

The inauguration of a revised curriculum and better teaching methods will require a prior reorientation of the training given to teachers. The curricula of Training Colleges should be recast radically in order to reduce the present excessive number of subjects and to bring the training nearer to the realistic conditions of the rural or urban areas for which the teachers are being trained. Colleges for training rural teachers should be located in rural areas where students can study rural problems and can actively participate in rural community life. Every Training College should have a demonstration school in which it should have the latitude to work out new teaching methods. At present such Colleges tend to be omnibus educational institutions which give too little time to the professional training of teachers. 875

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Intermediate and Secondary Education

873 The Mission has given great emphasis to primary schooling because it is convinced that the education base should be broadened. In the past education in Iraq has been too much like an inverted pyramid in which more attention has been paid to education at the higher stages than at the primary levels. This does not mean, of course, that intermediate and secondary education should not be allowed to develop at the same rate as in the past. As far as possible, however, the establishment of intermediate and secondary schools in rural areas should be given priority over those in urban areas, for such schools will be needed to produce candidates for the rural Training Colleges. The revision of the curriculum in these schools is of equal if not greater importance than in the case of primary schools. The present need is for a type of education which, in the words of Dr. Jamali, "prepares the citizens for better living and not one which produces men for white collar jobs with superficial learning, men who want to be government officials and clerks and not leaders and artisans in the fields of agriculture, commerce and social service."

Adult Education

871 Adult education has been largely neglected. There are some night schools operated by Teachers' Associations and the Ministry, but the syllabus of such schools is the same as that of corresponding schools for children. There are also a few adult literacy centers which concentrate on teaching adults to read and write.

The Mission urges that a program for adult education be drawn up and directed by a Special Division of Fundamental Education in the Ministry of Education. Such a program would be directed primarily to those groups in the population between 12 and 45 years of age. It would stress the acquisition of literacy, not as an end in itself but rather as a means to the acquisition of practical knowledge of the fundamental problems of better living. It is useless to teach people how to read and write unless by this means they can be shown how to work more effectively for their own good. For this reason a new and broader approach to education, different from the traditional schoolroom methods used to teach

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children, is required. This approach has been characterized by UNESCO as "fundamental education":

> "The main purpose of fundamental education is to help people to understand their immediate problems and to give them the skills to solve them through their own efforts. It is an emergency solution designed to help masses of illiterate adults and children in countries whose educational facilities have been inadequate. It is an attempt to salvage a generation by giving it the minimum of education needed to improve its way of life, its health, its productivity and its social, economic and political organization."[6]

This concept of education lays emphasis not only on the dissemination of practical training in health, hygiene, civics, agriculture, etc., but also on the employment of more modern media of communication such as audio-visual aids.

In a properly phased program of adult education an initial period of at least two years will need to be devoted to preparatory work and pilot projects. A small group of selected and specially trained teachers will be needed to test various educational techniques in a few pilot projects. The localities in which the program will be started will have to be selected and the cooperation of local leaders and officials enlisted. The subject of fundamental education will need to be incorporated in the curriculum of teachers' training colleges. Above all, suitable materials including primers, books, folders and visual aids such as films, slides, charts and maps will have to be assembled. UNESCO could give valuable assistance. In fact, it has already conducted a pilot project in the Dujaila area. Materials could also be borrowed and adapted from other countries such as India.

In the following three-year period the actual program might be begun by utilizing about 120, or approximately 10 percent, of existing schools also as evening community centers for adult education. A few schools might initially be chosen in each province so that these could serve as models and observation centers for other teachers. The program would be feasible only if the existing teacher corps were used also for adult education. It is impor-

[6] UNESCO *Courier*, June 1951.

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871 tant therefore to enlist their enthusiastic cooperation, for it would presumably not be possible to pay them more than a nominal amount in supplementary compensation. The efforts of these teachers would need to be complemented by assistance from other local officials in giving talks, demonstrating techniques, and showing materials on health, agriculture, irrigation, etc. Finally, in the following 10-year period, all of the remaining schools would gradually come into use as adult education centers. In the end the schools should become genuine community centers. In the smaller towns and villages, in particular, they should serve as the focal point for all instruction and as a center for community social life.

Administration

The program outlined above could not be carried out without some revision in the administration of the educational system. The present administration is too highly centralized. Everything is directed in minute detail from the center. As a consequence courses of instruction and methods of teaching are stereotyped and there is little or no opportunity for experimentation. The Ministry at Baghdad is so burdened with administrative detail that it cannot give adequate attention to policy and planning. More of the administrative routine should be handled by the provincial officials of the Ministry and headmasters should be given greater discretion in adapting curricula to local needs. While the time is not ripe to entrust responsibility for education to the provinces and municipalities, it is important that every effort be made to enlist the active assistance and cooperation of local officials and leaders in agriculture, commerce, industry and religion. They could assist in stimulating interest in the program and mobilizing voluntary contributions to its success. They could help, for instance, in organizing local parent cooperation and interest, in contributing equipment to schools and in providing meals and clothing for needy school children.

Continuity in educational policy has been seriously impaired in the past not only by frequent ministerial changes but also by frequent replacement of leading officials in the Ministry. Such officials should in the future be assured more permanent tenure. The Mission also suggests that consideration be given to the establishment of a Statutory Board or Council of Education. Such a Coun-

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cil, consisting of officials and non-officials conversant with different types of educational problems, might give valuable assistance to the Ministry in formulating educational policies and programs and guarding against hasty and ill-considered changes in approved programs.

Training Abroad

A word should finally be said of the Ministry of Education's program for educating Iraqis abroad. During the last 10 years no less than 781 Iraqis were sent abroad for education at government expense. Of these, 234 studied engineering; 53, other technical and industrial subjects; 103, agriculture; 39, commercial subjects; 24, medicine; 56, law; and 272, education. Many of these will be returning over the next few years and will be capable, if given an opportunity, of playing an important role in carrying out the development program. This type of educational program undoubtedly merits further expansion. At present the fields of study are decided by the Council of Ministers upon the recommendations of the various ministries. In the future it is suggested that the Development Board also be consulted on the most important requirements in the light of its overall program.

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VIII. Problems of Execution

A development program of the type outlined above obviously assumes great magnitude. In making its recommendations on the content of such a program, the Mission has constantly been mindful of the cost involved. The cost is not merely to be measured in monetary terms. It has to be translated into the real resources which must be mobilized to carry out the program—the organizational and administrative skills needed to get it on its way; the foreign and domestic services, materials and equipment directly required for its execution; and the additional goods and services for which a great demand will indirectly be created through expenditures on the program. The demand on these resources cannot be accurately assessed in advance, and satisfaction of the demand must depend not only on circumstances within Iraq but also on rapidly changing conditions abroad. The Mission has, however, explored some of the problems involved and believes that success in carrying out the program will depend on whether or not there is a full understanding of the actual and potential obstacles in the way and a determination to take timely action to overcome them.

The Mission has estimated the cost of the development program it envisages over the next five years, beginning with the fiscal year 1952-53. These estimates do not, of course, rest on detailed cost calculations. These will need to be worked out and translated into actual budgets by the Development Board working in cooperation with other government departments and assisted by expert technical advisers. For the most part, the Mission's figures are based upon estimates already included in the program of the Development Board or otherwise available in Iraq. Wherever appropriate, rough adjustments have been made for recent price developments. The outlay involved has accordingly been projected at a total of approximately ID 168 million, apportioned roughly among the various fields of development, as shown in the following table.

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Estimated Outlay of Development Program
(millions of dinars)

Flood control, irrigation and drainage		**55.2**
Reservoirs	27.6	
New irrigation works	18.6	
Improved irrigation maintenance and operation	2.0	
Drainage	7.0	
Agriculture and forestry		**7.5**
Grain storage	2.9	
Tobacco warehouses	0.25	
Agricultural Machinery Administration	0.25	
Incentives	0.5	
Agricultural Bank	1.45	
Miscellaneous	1.4	
Forestry	0.75	
Industry		**37.0**
Refinery	7.0*	
Chemical plant	25.0	
Capital for Industrial Bank	5.0	
Transport and communications		**31.0**
Railways	15.1	
Renewals including diesel traction	6.3	
Gauge conversion	5.0	
Repayment of railway loan	2.5	
Miscellaneous projects	1.3	
Roads	11.0	
Main	7.0	
Feeder	4.0	
Port—new channel	2.0	
Airports	0.9	
Baghdad bus transport	0.5	
Telephone and telegraph	1.5	
Community facilities		**23.2**
Water supply	6.0	
Electricity supply	1.5	
Sewage system—Baghdad	9.0	
Housing and mortgage credit	3.4	
Public buildings	3.3	
Education		**6.1**
Schools	5.0	
Other	1.1	
Public health		**5.0**
Hospitals, dispensaries and equipment	3.8	
Other	1.2	
Miscellaneous		**2.0**
Development Board—administration, studies, etc.		**1.5**
	Total	168.5

*Government estimate which may well be exceeded.

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654* In this program, the Mission has not included the expenditures already provided for in the 1951-52 budget of the Development Board. For the period 1952-53 to 1956-57, inclusive, the Mission has, however, taken into account not only those projects which it has studied and recommended, but also certain others which it has not examined in detail and which the government has already decided to carry out. The latter include the oil refinery, and a variety of projects such as public buildings and summer resorts, for which the Development Board has provided in its five-year program.

The program includes not only investment expenditures, but also increases in recurrent outlays which the Mission considers important to development. Since the ordinary budget out of which these recurring expenditures are generally defrayed will remain tight for a number of years, the Mission strongly recommends that any increases be financed by Development Board funds. Pressures for a reallocation of a designated portion of the oil revenues might well become irresistible if the Development Board insisted on confining its expenditures to purely investment projects and allowed the activities which are normally financed out of the regular budget to become starved of funds, no matter how important they might be. Such a development would seriously impair the prospects of carrying out a coherent program. Although in principle the segregation of revenues for particular purposes is open to serious question and the allocation of oil income to the Development Board will probably give the latter, within a few years, more than twice as much revenue as that accruing to the ordinary budget, the Mission believes that the continuation of this arrangement will be, on the whole, beneficial. It provides more definite assurance that the oil revenues will actually be used in the interest of an integrated program of development rather than dispersed over the whole field of the government's operations without making an effective, permanent contribution to a rise in the standard of living.

Financing the Program

651 654* As long as the oil revenues continue to be assigned to the Board, no serious difficulty in financing the contemplated development program should be encountered. As already indicated, the

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oil companies have assured the government an increase in the annual rate of production to 30 million tons by the end of 1955 and a division of profits which, it is estimated, may increase the government's revenues from oil to ID 59,000,000 in 1956-57. After allowing for Iraq's obligation to surrender to the Turkish government 10 percent of its revenues from the output of the Kirkuk and Mosul fields and for the repayment of ID 2,400,000 of past oil royalty advances, the government's net income from oil over the five-year period, 1952-53 to 1956-57, may reach about ID 214,000,000. This sum, plus about ID 3,000,000 representing the increase in revenue for 1951-52 not programmed in the Development Board's first annual budget, may thus be available to the Board for financing its program. The total amount would be ID 49,000,000 in excess of the entire developmental outlay contemplated by the Mission.

The Mission would strongly advise against any attempt to program this potential "surplus" at this time. First of all, such an attempt would be highly unrealistic in view of the enormous difficulties already involved in the appropriate expenditure of the sum suggested by the Mission. Secondly, the income from oil may fall below estimates. Finally, the cost of the program may well increase substantially under the impact of world-wide inflationary pressures. To the first of these, the Mission will later revert in some detail. The second is worth emphasizing because the new arrangement with the oil companies provides a variable rather than a fixed rate of return in the form of half of the profits before taxes. The revenue estimates cited above apparently rest on the assumption that the current price of oil will be maintained and that wages and new equipment costs will not rise significantly. If the anticipated relationship between costs of production and the price of oil is upset in such a way that the former rises more rapidly, profits and therefore income will fall below the expected levels. Although the oil companies have already made the bulk of their investment, future increases in wages and in the cost of additional equipment are not unlikely and may make future costs of production somewhat higher than current estimates. Whether such an eventual increase in costs would be offset by higher prices for crude oil depends on developments in world production and demand for

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651 oil. It is possible that the rapid rise in output which may be
654* expected to take place in other Middle Eastern countries, with the possible exception of Iran, will tend to restrain prices. In any event, it would be imprudent to rely on the receipt of all the anticipated revenue. In addition, part of the income should be set aside to meet contingencies and emergencies, particularly further increases in costs. The present low level of wages will unquestionably rise as the development program gets under way and demand for labor increases. Moreover, the rearmament effort under way in the West may exert a constant upward pressure on the prices of materials and equipment.

654* Since the oil revenues will be received in the form of sterling,
457 Iraq should have ample foreign exchange to defray the cost of imports required for the development program. There should be no need for foreign loans except perhaps to meet part of the hard currency needs. As a member of the sterling area, Iraq is dependent on the sterling area dollar pool for allocations of dollars. Until 1951 Iraq received a fixed annual allocation of hard currencies, but under a new arrangement, effective provisionally for one year, the United Kingdom has undertaken simply to furnish sufficient dollars to cover Iraq's essential needs. For part of the extraordinary dollar import requirements arising out of a rapidly expanding development program, Iraq may still have to borrow abroad.

Obstacles to Development

654* While financing the program will present no difficulty, the rate of expenditures envisaged will pose serious problems. To carry out a five-year program involving an outlay of ID 168,000,000, the Development Board would have to spend ID 15,000,000 in 1952-53 and successively larger sums up to a total of ID 50,000,000 in 1956-57. The experience of other countries in process of development illustrates that it is not easy to spend money rapidly and efficiently on well-conceived projects. Expenditures in most cases tend to fall short of the targets. The International Bank, for example, has noted that disbursements on its loans to underdeveloped countries seldom conform to original schedules. In Iraq the development program will require the government to gear itself to an annual rate of expenditures which at the end of the next five years will need

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to be about two and a half times the combined outlays (ID 37,200,000) of the government, the railways and the Port of Basra in 1950-51. Moreover, actual development expenditures, which require proportionately far more technical and administrative organization and preparation than ordinary outlays, will need to rise to a rate about 10 times the total public capital expenditures (ID 5,200,000) in 1950-51. 654x

Such a rate of expenditure will be achieved only with great effort and by careful planning. It will necessitate substantial improvement in the efficiency of public administration so that the government will be capable of coordinated planning and execution of the program. It will be necessary to take full advantage of technical assistance available abroad and to enlist experienced foreign firms for the purpose of planning and designing as well as executing major works.

Improvement in Public Administration

Improvement in public administration is of key importance. The multiplicity of projects in the development program will require an enormous amount of detailed administrative and technical preparation, all of which must be properly coordinated. As indicated by the nature of the Mission's recommendations, the work involved will fall on many ministries and departments and not simply on the Development Board. Moreover, in order to avoid overburdening the Development Board, the latter should be in the position to decentralize as far as possible the detailed planning and execution, reserving to itself principally the task of overall planning and coordination. Decentralization would also contribute to morale by giving the entire government service a sense of participation in constructive endeavor which now appears to be lacking. 654x 647

Public administration in Iraq, as in many other underdeveloped countries, requires improvement in many respects. Excessive centralization causes ministers and high officials to be overburdened with detail to the neglect of policy formulation and planning. Inadequate use is made of such talent and knowledge as is available elsewhere in the government, including the local administrations. Coordination of related activities is frequently lacking, so that, for instance, there is no cooperation in the planning and operation of

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654 irrigation works among agricultural officials in the Ministry of 647 Economics, the Irrigation Department of the Ministry of Public Works and health officials in the Ministry of Social Affairs. The efficiency of civil servants seems to have declined since before the war. Certainly the increase in the number of government employees (excluding police) from about 11,000 before the war to almost 20,000 in 1950 has been considerably out of proportion to the expansion in the government's functions. Many government offices appear to be overstaffed, while others cannot obtain extra personnel for essential increases in services. Officials are frequently shifted from one position to another without regard for their qualifications and experience. Often government officials both in the provinces and in the capital do not enjoy sufficient continuity in office to enable them to become really useful. Promotion appears to be based almost entirely on seniority and other considerations rather than on merit. The morale among government servants is generally low.

647 The two most important factors contributing to inefficiency 465 and morale are probably the low level of government salaries and the lack of any sense of real participation in constructive work. Since before the war salaries and allowances have risen only 20 percent for high government officials and 160 percent for the lowest paid officials, while the official cost-of-living index has increased by about 400 percent. To some extent, however, there has been an increase in salaries through shifts to higher grades, so that, judging from comparative total disbursements of salaries and allowances, it may be concluded that average salaries have risen by about 130 percent since before the war.[7] Nevertheless, salaries, particularly of officials in the higher classes of the civil service, are very [441] inadequate. The probity of officials is thus put to a severe test and to the extent that some successfully utilize their positions as opportunities for personal gain, the morale of others suffers. Moreover, many civil servants are compelled to supplement their salaries by engaging in business or accepting other employment with resulting neglect of their official duties.

654 The lack of a real sense of participation in constructive 647 tasks is conspicuous in the civil service. The Mission found a wide-

[7] Total disbursements of ID 14,700,000 on salaries and allowances in 1949-50 compared with a sum of about ID 3,500,000 before the war.

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spread feeling that nothing was being accomplished. Although the establishment of the Development Board and the large prospective increase in oil revenues appears to put Iraq on the threshold of an era of potentially great progress, the Mission discovered very little awareness of these developments among officials both at the center and in the provinces. Where this awareness existed, it was often accompanied by an inclination to disparage the results likely to be achieved. Thus it appears that the government has largely neglected the opportunity to acquaint its officials with its program for the future and to enlist their enthusiastic cooperation in lifting Iraq to a higher plane of economic development.

In order to remedy some of these shortcomings, the Mission urges that a small commission, consisting of high Iraqi officials assisted by two foreign experts in public administration and personnel, be appointed to make a complete survey of the system of public administration and recommend improvements therein. This commission should inquire into the training, classification and promotion of government officials and the appropriate staffing of government departments. It should devise a new and adequate pay scale which should take into account inequities in the existing salary structure and provide relatively higher pay and improved amenities for officials working in the provinces. It should examine also the measures which might be taken to improve the coordination of government activities and to bring about a gradual decentralization of administrative functions.

Pending the commission's study and recommendations, the government might take certain interim steps to improve its operations. One of these might be the appointment of a permanent Secretary in each ministry who would be responsible for the coordinated administration of the ministry. He would relieve the Minister of as much detail as possible and would brief the Minister on major policy questions requiring his decision. The other might be an interim, perhaps initially modest, general increase in the salaries or allowances of government officials. It might be desirable to cover at least part of the cost of the interim and final increase in salaries out of additional taxes, but some resort to the funds at the disposal of the Development Board may not be inappropriate in view of the importance of more efficient public administration to development.

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654 647 Finally, the Development Board should, as far as possible, enlist the aid and cooperation of other government ministries and agencies and of the provincial and municipal administrations in the task of planning and carrying out a development program. It should actively encourage them to submit suggestions and plans for development, integrate these plans with each other and the Board's own, and, to the maximum extent feasible, allocate money and responsibility for the execution of these plans and projects to other agencies. The establishment of a Community Planning Office and a Housing Authority, as proposed earlier by the Mission, would be in line with this suggestion.

In the last analysis the Development Board would, of course, retain the final responsibility for formulating the overall program, for coordinating those projects such as irrigation which concern many government departments, and for allocating the funds necessary to finance the various parts of the program. In order to enable the Board to carry out this overall coordinating and planning function, it is essential that all major development projects be brought within its purview, even though its financial assistance may not in all instances be necessary. At present, projects for a government petroleum refinery, a government textile mill and a new grain silo are all being kept outside of the Board's jurisdiction. The formulation of an integrated program with a well-conceived system of priorities is difficult as long as this remains the practice. In addition, coordination would be facilitated if the Board, of which only the Prime Minister and Minister of Finance are ex officio members, were to give the Ministers of Economics, Agriculture (a new Ministry proposed by the Mission), Public Works and Social Affairs facilities for attending Board sessions whenever matters of interest to them are being discussed. The possibility of making the Governor of the National Bank also an ex officio member of the Board might be considered.

654 463 ***Technical Assistance***

A substantial increase in the technical staff available to the government will also be of critical importance to the success of the development program. No project should be approved under the program until evidence is submitted that it is technically sound in

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its conception and that technical skills are available to carry it to successful completion. It will not be possible actually to spend the mounting revenues available for development unless, in the period immediately ahead, the Development Board insures that the government is equipped with a staff capable of undertaking the detailed technical preparatory work required by numerous projects.

At present the government service is admittedly deficient in technical talent. In the long run this deficiency can only be overcome by training Iraqis, but in the short run it must be met by the employment of foreign experts for periods of varying duration.

For major projects it will be possible and usually necessary to enlist the assistance of foreign consulting engineering firms and foreign contractors. In general, such projects will be of two types. Most industrial projects will represent one type. Here it will be necessary to formulate basic specifications such as plant capacity, quality of products and production costs, but the plants involved will be based on standardized processes so that bids can be invited directly from manufacturers or contractors on an erected basis with all of the necessary engineering work to be done by the contractor. The contract in a case of this type would specify the details of the equipment to be furnished and would make definite guarantees as to quality of products and production costs. The second type of project involves those for which standardized designs are not available. and where a large amount of civil works is involved. In such cases the preliminary engineering work should be done, before inviting bids on construction, by qualified consulting engineers who will not bid on the construction work. In general it would be desirable to have the firm chosen to make the preliminary studies also prepare the specifications and conditions upon which bids will be invited, as well as select the qualified bidders, analyze the bids received, and later supervise the contractor.

For the large number of smaller projects, however, individual technicians will be needed to assist both in the planning and the implementation. In connection with its recommendations in the various fields of development, the Mission has indicated more specifically the kind and scope of technical assistance required. The government has already made many applications for technical assistance to agencies of the United Nations, and to the United

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Kingdom and the United States, but it is important that the government devise some means for coordinating such requests in the future so that priority will be given to those which will be most helpful to development. Competent foreign technicians are not unlimited in supply and the accommodations and facilities which such experts will require in Iraq are likewise restricted.

In some cases foreign experts will be required only for short periods to make surveys of particular problems or to look into the technical aspects of particular projects. In many other cases, however, technical assistance will be needed over longer periods to carry out specific programs. Qualities of patience and persistence as well as technical competence will be required of foreign experts engaged for such tasks. Frequently it will be desirable to give such experts positions of executive and administrative responsibility in order to insure that the job will be done within the allotted time. Appointments of this character need not be regarded as impairing national sovereignty, since the foreign expert will be carrying out programs approved by the government and arrangements can be made to provide each expert with an Iraqi deputy who would be trained to take his place as rapidly as feasible.

In addition to its recommendations for technical assistance in particular fields, the Mission suggests that a small corps of competent engineers be attached to the Development Board under conditions which would insure more or less autonomous administration. Such a group, which would have to be recruited primarily abroad and necessarily be highly paid, would operate as a pool of technicians who would be available for examining the technical soundness and preparation of projects originating both with the Board and with other government departments. A pool of this character would economize on the number of engineers needed throughout the government. It would also be equipped to find and help recruit foreign experts needed for short-term assignments and to check on the work done by contracting firms. Finally, by operating as a more or less autonomous group under the Development Board, it would relieve the Board of technical details and enable it to devote its attention to overall planning with the confidence that projects coming before it for final approval were technically sound.

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The technical advice thus available to the Board would usefully be complemented by an economic adviser to whom reference will be made later.

Skilled Labor

Other difficulties may well emerge in the supply of foremen, skilled and semi-skilled workers. Even now it seems to be difficult to find certain kinds of skilled workers in Iraq, and consequently they are able to command high wages compared with unskilled labor. If acute shortages are not to develop later on, it will be necessary for the Development Board to determine promptly what types of skills are likely to be in greatest demand as a result of the development program and to inquire how appropriate training can be instituted. So far as requirements for major public works are concerned, the Board will, no doubt, be able to obtain useful advice from local and foreign contracting firms with experience in Iraq. Information on requirements for other projects may be obtained from the appropriate organizations such as the railways and the Industrial Bank. Once even a rough idea of the requirements has been ascertained, the extent and quality of the available supply and the methods of training the necessary additional workers should be discussed with the Directorate of Labor, the Ministry of Education and such organizations as could be expected to cooperate in programs of training.

The Mission would not wish to suggest that this kind of manpower budgeting is an infallible way of solving all shortages. It is, however, well known that other countries, which are developing much more slowly than Iraq is likely to do within the next few years, have run up against shortages of skilled labor that might have been avoided with foresight and preparation. The Mission feels that there is sufficient evidence to show that the potential quality of Iraqi labor will not prove an obstacle. On a number of occasions the Mission members saw considerable mechanical ingenuity displayed by men with little training and inadequate tools; and these observations were confirmed by those with experience in Iraq. It would do less than justice to the Iraqi worker if the development of his innate skills were not encouraged in the directions where they are likely to be most urgently needed.

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654* 464 Up to the present the Development Board has had no occasion to consider measures to avert particular labor shortages. Training does, however, take time and it is probably not too early to carry out at least a preliminary review of requirements. The Mission recommends that this be done in close cooperation with the Directorate of Labor, which, as recommended elsewhere, requires considerable strengthening.

Finally, where acute shortages do develop, the government could in the last analysis import labor. Thus among the large number of Arab refugees from Palestine there could be found many mechanics, carpenters, electricians, stoneworkers, plumbers, foremen, as well as a large number of unskilled construction workers. Contractors could also obtain foremen and some specialized workers from other countries in the Middle East.

Foreign Supplies

654* Now that defense programs in the United States and Western Europe are going into high gear, Iraq may experience difficulties in obtaining equipment and supplies, and this may retard the rate at which development expenditures can be increased. One limiting factor is likely to be steel, especially steel plates and sheets and certain specialty products. This may affect the deliveries of railway equipment, even though, as in Europe, there is open capacity for the manufacture of rolling stock.

Other obstacles may be encountered in the construction projects. The market for construction equipment, particularly for certain kinds of heavy equipment, is becoming increasingly tight and anticipated deliveries may be slow. As a considerable part of the production of this equipment is covered by priority orders in the United States, it may be difficult to obtain unless a priority rating can be secured. European sources of heavy construction equipment are also tight and, although there may be some capacity for manufacture of fairly large-size equipment, overall availability in Europe, especially for heavy types, is much less than in the United States. Accordingly, it may well be desirable to carry out large-scale construction projects, if possible, through those recognized international contractors who possess substantial pools of the necessary machinery. Such an arrangement frequently results in a reduction in the amount of new equipment to be procured. Conceivably,

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however, it may become difficult to find sufficient foreign contractors to undertake major construction projects. 654 ×

The Problem of Priorities

In most developing countries the problem of determining relative priorities among various possible projects arises from the scarcity of financial resources. Iraq is fortunate in that this is hardly likely to be a limiting factor. The problem may, however, arise for other reasons. The burden of administrative responsibility on both the Development Board and the government departments may initially delay the preparatory work necessary for the efficient execution of the program. Some indication of relative priorities may from this point of view be desirable. The problem may also arise as a result of a shortage of those types of skilled labor, materials or equipment needed on more than one project. As it is impossible at this time to state just where such bottlenecks may arise, no hard and fast system of priorities can be laid down. The important thing is to watch for indications that they may arise, to avert them if possible and, if not, to decide in good time what steps must be taken as a consequence.

Although no definitive statement is possible, certain general observations as to the principles for deciding priorities can be made. In the first place, projects which are intended to conserve the existing resources of the country ought not to be delayed to the point where it becomes excessively costly to recover them or where the smooth working of the economy is endangered. This would apply particularly to the maintenance of existing irrigation systems and the drainage of existing irrigated areas as well as to the maintenance of the railways.

A second principle is that where competition between projects for scarce equipment or other resources arises, it is usually desirable to aim at the completion of one single project or group of connected projects in preference to the partial completion of several unrelated projects. This is largely a question of timing. The digging of a canal system should proceed in accordance with the construction schedule of the dam which is to assure its water supply. Similarly, it is clearly useless to engage in an extensive program of building schools or hospitals before an adequate staff of teachers,

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doctors and nurses becomes available. A less obvious example concerns the mechanization of agriculture. Earlier in the Report the Mission pointed out that, while mechanization is a fruitful method of increasing yields both per donum and per agricultural worker, comparatively little good will come of it so long as the fellahin who may be displaced can find no alternative occupation or so long as lack of repair facilities impedes the most economic use of existing machinery.

As a third principle the Mission would stress the need to avoid neglecting those parts of the program that are of a long run character. For example, the development of an agricultural extension service and the introduction of measures for the gradual improvement of livestock are of the highest importance. The temptation to put off such activities because they show no early visible or quick returns can be a strong and continuing one. The Mission is, however, strongly of the opinion that these are among the most vital parts of the program. In the future Iraq will have to depend as much on the more efficient use of water as on increasing the available supply. And it may be added that the inauguration of an accelerated program for training teachers and the modification of curricula in rural schools in order to bring them into closer touch with the everyday needs of the people will serve the same end.

Certain other factors may enter into the determination of priorities as a result of the repercussions of the program which are discussed below. If the pressure on the available manpower becomes severe and inflationary symptoms appear, it will be desirable to postpone or slow up those labor-intensive projects which are least urgent in the short run, such as part of the road-building program and the construction of public buildings, grain silos and public housing.

It is important that priorities be kept flexible in the light of changing circumstances. The Mission has indicated certain development targets, but the allocation of resources which is implicit in these targets cannot necessarily stand for the next five years. To keep the allocation of resources and the determination of priorities under constant review, the Mission strongly recommends that a competent economic adviser, preferably with experience in underdeveloped countries, be appointed to the Development Board. Such

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an adviser, who should be given a small staff, could assist in determining the impact on the economy of particular projects and the program as a whole and in watching for developing strains and bottlenecks. In view of the importance of economic considerations in the formation of the Board's policy, the economic adviser should have the right to participate in all meetings of the Board. His presence at meetings would also afford the Prime Minister and the Minister of Finance, who are ex officio members of the Board, an opportunity to receive a direct report on how the development program might affect matters of broad economic policy falling outside the immediate scope of the Board itself.

The adviser would also be able to indicate the types of additional information which should be developed in order that the economic repercussions of the program may be more carefully observed. For this reason the Mission suggests that the fact-finding agencies of the government be greatly strengthened and reorganized by merging into a single statistical organization the Directorate-General of the Census and the Principal Bureau of Statistics, establishing a special section on agricultural statistics within the Ministry charged with agriculture, and expanding the Department of Labor in the Ministry of Social Affairs.[8]

IX. Impact of the Program

The execution of a development program of the magnitude recommended by the Mission is bound to have great repercussions on the economy. The magnitude of the expenditure in comparison with the current rate of government spending has already been noted, but its effect on foreign trade, on national income and on employment can also be assessed in broad terms.

If the trade financed by the oil companies is excluded, imports regularly exceed exports by a large margin. For example, in 1949 imports were valued at ID 30,000,000 and exports at ID 12,000,000, leaving a gap of ID 18,000,000. The gap was much larger in 1948 and much smaller in 1950, so that the figure for 1949 represents approximately the average for the last three years. To a

[8] See Appendix C, *Statistical Organisation.*

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certain extent, this has been financed by a net drawing on Iraq's sterling balances, but the most important source of finance has been the oil companies. During the last three years they have transferred to Iraq an average of nearly £10,000,000 in sterling annually. Part of this consists of royalties and other contractual payments paid to the government and subsequently spent by it, mainly on projects in the capital budget. The larger part, however, has been transferred to pay for current expenses of the oil companies for production, construction projects and exploration. These expenditures have directly or indirectly provided income for the people, which in turn has created a demand for imported goods; the foreign exchange has provided the means to pay for them. Thus the activities of the oil companies can be said to have both caused and financed a large part of the gap.

The same process will continue as expenditure by the Development Board rises. The Mission envisages that this may reach ID 50,000,000 in about five years' time. Some imports of materials or machinery will result directly from the requirements of the program. The balance of the Board's expenditures will, however, be for the most part made in Iraq. The large quantity of money, which will thereby be put into circulation, will pass from hand to hand and most of it will eventually be spent on imports. This means that in the next five years imports can be expected to increase by a large proportion of the ID 50,000,000 to be spent by the Development Board. At the least, the value of imports is likely to be double what it has been in the last few years.

The magnitude of the program and its effect on the economy may also be illustrated by consideration of the national income. The national income of Iraq in 1949 was estimated by the Statistical Office of the United Nations at a figure in dollars equivalent to either ID 100,000,000 or ID 150,000,000, depending on the exchange rate. On the basis of some rough and incomplete calculations the Mission estimates that the actual figure probably fell near the middle of this range. It may now be nearer the upper end, since the price and the volume of production of some commodities, especially cotton, has greatly increased and some industrial expansion has taken place. Thus an increase in the government's annual income from oil of ID 50,000,000 would alone be equivalent to at

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least one third of the national income. Subsequently, of course, part of this income is used to pay for labor, transport and materials inside Iraq, and then spent again by those who receive these payments, thus generating a further increase in income among the people. The size of the total addition to the national income cannot be forecast, but it is certain to be substantial.

The size of the program can also be gauged in terms of manpower. The Mission has not attempted to make a detailed estimate of the quantity of labor which will be required to fulfill the program, much less the numbers who will find employment as a result of the higher level of economic activity. But an example will serve to illustrate the orders of magnitude involved. If 100,000 additional workers found employment as a result of the program at an average annual wage of ID 100, this would mean an expenditure on labor of ID 10,000,000, which would be only one fifth of the ID 50,000,000 the Development Board may ultimately spend per year on the projects themselves. Since these Development Board expenditures would, in turn, generate expansion in activity and employment in transport, industry and commerce, a figure of 100,000 cannot be regarded as excessive. It is, of course, not intended as a forecast. The actual figure may be considerably higher or lower, depending, to some extent, on how much machinery is used on the construction projects. But it will serve as an order of magnitude for the number of new jobs which may be created and which would have to be filled by the unemployed, by new additions to the labor force such as the increase in population, or by people shifted from their existing occupations. As such it may be compared with the current labor force outside of agriculture, which, on the basis of the information available to it, the Mission believes is probably not more than half a million.

Thus, on these various hypotheses, great changes can be expected which will affect the whole pattern of life. The national income will increase at a rate which, though not unparalleled, can certainly be considered exceptional. Large shifts in employment will occur as a consequence. The import trade will grow rapidly and with it, for example, customs revenues and the revenues of the Railways and the Port of Basra. It remains to examine the possible effects of these changes.

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Effect on Incomes and Prices

458 During the war and for a short time afterwards, Iraq experienced a severe inflation. Since then, it has enjoyed a fair degree of monetary stability, largely as a result of the conservative financial policies of the government. In fact special local circumstances have lately induced a certain degree of deflation in spite of the strong inflationary influences prevailing in the world outside. The sharp rise in the level of employment and income which will ensue from the development program is bound to alter the whole structure of the economy. Upward movements in wages and prices can certainly be expected. In part, these will be the unavoidable concomitant of the process of development. In part, they may be the result of a general inflation in world prices, which would be beyond the control of Iraq.

654x 458 The principal task confronting the government is to prevent an inflation in any way comparable to the wartime one. It is most important to avoid a marked wage and price inflation which would not only make development far more expensive, but might also create serious discontent. The government has, however, ample means at its disposal to avert such a danger, if it allows liberal use of its sterling income from oil to pay for imports.

The principal reason for the wartime inflation was the large expenditure of money by the military forces in Iraq and the lack of imported goods—for obviously cogent reasons—to satisfy the ensuing demand. Given a sufficient supply of consumer goods from abroad, there should be no reason in peacetime to repeat this [551] experience. Accordingly the Mission would recommend that in due course a competent committee re-examine the customs tariff and the system of import licensing. Some of the restrictions in the present licensing system were imposed to meet a passing situation and could well be discarded. Certain objectives, for example, restriction of imports of "luxury" goods in favor of necessities, might be better accomplished by appropriate changes in the customs tariff. Efforts should also be made to discard, if only gradually, the present method of customs valuation for goods assessed ad valorem, whereby the domestic wholesale price is taken as the basis of valuation.

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If these measures are taken to allow a free flow of imported goods, the possibility of a severe inflation should be remote. There may, of course, be difficulty in obtaining consumer goods from abroad. If this contingency should arise, it will probably be even more difficult to obtain machinery. Thus the government will be confronted, on the one hand, with the need to use a large amount of labor on its construction projects and, on the other, with a lack of goods for them to buy. In this predicament, if inflation is to be avoided and the program is not to be delayed, the government will have to siphon off that part of the increased incomes for which there is no corresponding supply of goods. This can best be done by both direct and indirect taxation at a rate which will insure a budget surplus and by sterilization of this surplus. Initially these funds might be used to retire the public debt, which is for the most part held by the banks.

Nevertheless, even if these steps are followed and severe inflation avoided, some changes in wages and prices will occur. To a large extent, movements in wages will depend on how easy it is to find the additional manpower required on development projects. Undoubtedly there is a reservoir of unemployed and underemployed people which could be tapped. As indicated earlier, considerable unemployment exists in Baghdad, Basra and Mosul, and there are many people underemployed who would welcome opportunities for full-time work. The natural growth of population should add at least 15,000 to the labor force yearly. In the country the fellah would probably be unavailable for nonagricultural work even in the off season except perhaps in the immediate neighborhood of his home, but members of his family or relatives living with him might take advantage of new employment opportunities without a significant effect on farm output. The nomadic population may also prove to be a source of labor.

But the point will, no doubt, be reached when competition for manpower will start to drive up wages and to make agricultural workers increasingly scarce in certain districts. This would not necessarily be an unwholesome symptom. Many people are employed in a very unproductive manner, simply because labor is so cheap. Coolies carry heavy loads which should be carried by truck. Production methods in many industries and handicrafts are

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654* 464 exteremely primitive and new machines—sometimes merely a simple power tool—would greatly reduce the requirements for labor. On the land, especially, there are a number of areas where there is a heavy concentration of fellahin working small plots with the crudesf tools. Mechanization, even of a simple kind, could easily make good the loss of a part of this labor. In fact, in some parts of the country, landlords are reluctant to mechanize for fear of displacing their fellahin. Thus a moderate rise in wages would improve the lot of those who take employment on the development projects and should also provide incentive to industrial and agricultural employers to give more productive and remunerative employment to those who remain.

One point should be stressed at this stage concerning the drain of manpower from the land. To the extent that this drain consists of "surplus" manpower which is already grossly underemployed, the drain can be considered a welcome change for the better. If conditions do not improve on the land, however, the drain might reach proportions which would endanger the future of agricultural production. It is notoriously easy to attract people away from the land with the promise of better opportunities and almost impossible to draw them back once they have left. Improvement in the lot of the fellah is therefore of vital importance.

654* 434 As wages may rise, so may certain prices. Demand will greatly increase, but it is as much its incidence as its volume that matters. If a liberal import policy is followed, there should be no pressure on the price of such imported goods as textiles and sugar, although, of course, changes in world prices cannot be avoided. As incomes increase, greater pressure can be expected on some local products, whose supply cannot be quickly increased and which can only be imported for considerably higher prices. In this category fall a number of foods, especially meat and other animal products such as milk and ghee. Some improvement in supply will occur as a result of diversion from exports, but this possibility is limited. In the short run, at least, somewhat higher prices for these commodities should be accepted as the price of a generally higher standard of living for the mass of the people. The same may be true of fruit (other than dates), the supply of which cannot increase until such time as newly planted trees come into bearing. The production of

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vegetables, on the other hand, can be increased more readily and a tendency for prices to rise will probably induce an increase in output fairly quickly.

There will also be considerable changes in incomes. Increased or more remunerative employment would of course benefit a large number of workers. Many agricultural workers are likely to benefit. As a result of the greatly increased activity in the import trade, merchants are likely to be very prosperous. In certain localities housing shortages may develop, thus permitting landlords to raise their rents. On the other hand, some classes, particularly civil servants and others employed at fixed salaries, may stand to lose owing to higher prices of some of their essential needs.

It will be an important task of the government to insure that these changes do not result in an inequitable shift in the distribution of incomes. This may be achieved in various ways: by export taxes on agricultural commodities whenever prices rise substantially; by changes in the rates of import duties, the burden of which at present falls heavily on the poorer classes; by raising the exemption limit for income taxes and by enforcing stricter assessment and collection in the higher brackets; or by an increase in allowances to civil servants. The Mission does not recommend specific remedies for a situation whose nature can only be forecast in general terms. It would stress, however, the need to keep a careful watch on the nature of the changes that the economy is undergoing. The Mission therefore recommends strongly that a committee be formed consisting of the proposed economic adviser to the Development Board and high-level representatives of the National Bank and the Ministries of Finance and Economics. This group would recommend directly to the Council of Ministers the adoption of timely measures aimed at checking any dangerous inflationary trends and at offsetting any tendency toward gross inequities in the distribution of income.

No mention has yet been made of the possibility of loss of foreign exchange by the National Bank as a result of the development program. In itself the program cannot cause an increase in expenditure on imports in excess of the outlay on the development program. In fact, as there will be some need on the part of individuals or organizations to hold larger cash balances, they will save

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654* 457 part of their income in this form and there will be some net gain of foreign exchange by the National Bank.

The effect of the development program on the economy as a whole, however, has to be borne in mind. A general rise in the level of prices and wages will tend to increase consumption at the expense of savings. At the same time, there will be considerable incentive to make more investment outside the development program than in the past. Thus, quite apart from the effect of the program itself, there will be some pressure to expand imports. Whether this pressure could be sufficiently strong to cause an expansion of imports by more than the amount of foreign exchange used to finance the development program is uncertain, but the possibility exists. It will be important, therefore, to avoid any further pressure on the payments position by an excessive expansion of credit to business or by financing a large budget deficit through bank credit.

654* 652 As long as ordinary government expenditures not immediately related to development are kept down and tax income maintained, there should be no serious danger of ordinary budget deficits. In fact, as national income rises as a result of increased development expenditures, ordinary revenues will probably rise more rapidly than ordinary expenditure. The government, however, will have to incur some expenditures which were, in the past, covered by income accruing from oil. Now that this income has been earmarked for the purposes of development, the deficiency has to be made up from ordinary revenue. It may, therefore, be necessary in the first few years for the government to borrow from the Development Board a part of the funds accruing to them, repayment being made when ordinary revenues begin to rise substantially. This should not interfere unduly with development, as the pace of actual expenditure on development is likely to be slow initially.

Measures to curb credit expansion may prove more difficult as long as the banks are extraordinarily liquid. Statutory reserve requirements would have to be greatly increased to permit effective credit controls. The private banks, most of which are foreign-owned, have, in the past, however, concentrated almost exclusively on the financing of trade, particularly foreign trade. Even if increased opportunities arise in the future, they may show little dis-

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position to finance investment expenditures. The National Bank should operate essentially as a banker for the commercial banks and therefore should not finance long-term investment. To discourage credit expansion on the basis of the larger foreign income which will accrue from oil, the Mission suggests that, instead of selling sterling receipts to the National Bank, the government segregate them in a special account in London apart from the country's regular foreign exchange reserves until such time as they are spent abroad or the dinar equivalent is spent in Iraq.

Tax Reform

Total tax revenues will probably not need to be increased provided any temporary ordinary budget deficit can be met by short-term borrowing of idle funds at the disposal of the Development Board. The only exception might be taxation to pay part of the cost of raising government salaries. On the other hand, some revision in the tax structure to provide a more equitable apportionment of the burden would be desirable. In common with many other underdeveloped countries Iraq relies strongly on indirect taxes which bear heavily on consumers without taking into account capacity to pay. Thus in the last three fiscal years indirect taxes contributed about 82 percent of all tax receipts and 71.5 percent of all budget income, while direct taxes accounted for only 18 percent of all tax revenues and 13 percent of total government receipts. While drastic changes in the tax structure may not be feasible, some decrease in the burden of indirect taxes appears desirable. There might well be a reduction in import duties on some essential goods such as sugar and cheap cotton and rayon textiles, offset, perhaps, by an excise tax on luxuries. Likewise it may be desirable to decrease and gradually abolish, except in its application to exports, the so-called *istihlak* tax which is levied on produce brought to market and at a rate varying in recent years between 10 and 12½ percent of approximate market prices. Except for the partial incidence of this tax, agriculture in Iraq is hardly taxed at all. The income tax which bears very heavily on the salaried classes, whose income is already comparatively low, does not apply to income from either agricultural land or urban property. Agricultural land in private hands has not been taxed since 1936 when a land and water

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654* 651 [425] rent tax was abolished in return for certain payments to be made by the landholders over a maximum period of ten years. Thus the tax system discriminates in favor of those who have managed to obtain state lands in *lazmah* grant and against those who have regularly leased land from the state. The latter continue to be assessed for rent whereas the former, who have frequently secured large *lazmah* grants on the basis of rather tenuous proof of occupancy and cultivation, escape any tax or rent assessments on their land.

The application of a graduated income tax to agriculture, while equitable, may not be politically feasible at present and would certainly pose difficult problems of assessment. Consideration should be given, however, to the reintroduction of some type of land tax. The fact that the cadastral survey is only half completed would not be an insuperable obstacle. In most cases the land held by each individual will be well known in the locality where he resides. Landholders could be required to register for taxation all the land they claim with the provision that they would not be allowed to establish claims during the cadastral survey to any lands not so registered; and in case of conflicts between actual occupants and other claimants, the tax could provisionally be levied on the actual occupant. It would probably be desirable to levy the tax on cultivable land rather than land actually under cultivation in order to provide an incentive to production or, alternatively, to release idle land for resettlement. Tax rates would have to vary in accordance with productivity of the land, which could, as in some other countries, be ascertained through tests or control plots located in various parts of the country. The tax rate should presumably also take into account the government contribution to irrigation of the land. The adoption of such a land tax might be linked with the gradual reduction and perhaps ultimate abolition of the *istihlak*.

X. Conclusion

511 Today the people of Iraq for the most part suffer from dire poverty. Although a relatively small number of city merchants and landowners enjoy high incomes, the average standard of life is extremely low. The future would hold little prospect for relief if

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the only remedy available were a more equitable division of income. Fortunately, the future does afford the promise of a large increase in national income as a whole. The country has the natural resources—land, water and oil—which can bring a much higher standard of living to all. The revenues from oil will provide the means for a potentially rapid development of other productive resources. The central objective must be the attainment of a much higher output in a manner that will benefit the people as a whole.

In a country like Iraq principal emphasis will inevitably need to be placed on the development of agriculture. For this reason schemes for the storage of the flood waters of the Euphrates and the Tigris will be of key importance. They will prevent disastrous floods and control the flow of the rivers so as to bring more water to deficient areas and open up large new areas for settlement by land-hungry peasants. An increase in production, however, will not come simply from an expansion of the area under cultivation. The time will come when further expansion will not be possible except at great cost. This makes it all the more necessary to raise the present low productivity of agriculture. The drainage of lands which have deteriorated owing to salting has accordingly been emphasized by the Mission as one of the first objectives. Great importance is also attached to the early development of an adequate agricultural extension service, supported by an effective practical experimental organization, which would work directly with farmers in improving their methods of production. Other measures recommended to this end include the provision of incentives to use fertilizers and to cultivate soil-building and fodder crops, and the organization of cooperatives and more ample credit facilities so that farmers can have easier access to improved means of production—better plows and draft animals, other agricultural machinery, seeds and fertilizers.

Industrial development can in many ways effectively complement agriculture. The proposed chemical plant at Kirkuk, supplemented by bonemeal plants, could provide the cheap fertilizers needed to raise the productivity of Iraqi agriculture. Expansion of cotton textile and vegetable oil extraction capacity would capitalize on the growing output of cotton. The proposed modern machine shop would cater to agriculture by reducing the cost of irrigation

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654 pumps. In other respects industrial development would be geared to supply the growing demand for consumers goods, such as shoes, textiles and utensils, and for construction materials, such as cement, arising out of the development program itself.

654 Rising agricultural and industrial output will necessitate a corresponding increase in transport capacity. Here the development of road transport and the replacement of wornout track, locomotives and rolling stock will be the principal tasks of the future.

654 Since the relationship of health and education to production may appear more indirect, there is danger that these two subjects will be neglected in the emphasis on greater national output. Basically, however, it is the productivity of manpower which must be raised, and this can be achieved only if measures are taken to make people better educated and to free them from debilitating disease. In the future the public health effort must concentrate on the prevention of disease through such measures as increasing the number of village dispensaries, the training of midwives, the organization of a corps of sanitarians, elimination of stagnant and polluted water, provision of safe water supplies and sewage disposal, slum clearance and better housing. Community planning should focus largely on such improvements as will contribute to better public health. A great broadening of the educational effort is needed in the future to teach people how to cope more effectively with the problems of everyday living. To this end, compulsory primary education should be gradually introduced over the next 15 years and a vigorous campaign for the education of adults should be launched. At the same time, however, it is vitally important to adapt education to the practical needs of the people, helping them to improve their health and their methods of work.

654 The program which the Mission has outlined in this report is undoubtedly ambitious. It requires a rate of progress unprecedented for a country which for many centuries remained virtually static and which over recent decades has developed at a relatively slow pace. There is no assurance that the program can be carried out over the next five years. Yet the Mission has thought it important to set up targets, even ambitious targets, toward which the country can strive. If successful, the program will bring about a

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profound economic and social transformation, with far-reaching repercussions.

Accomplishment of the greater part or all of the program will require the united energies of the nation. While foreign technical assistance and materials will be needed, success of the program will depend, above all, upon the people of Iraq. Development is not the function or prerogative solely of the Development Board. It will require not only the wholehearted cooperation of the entire government but, above all, a sustained and energetic effort by the Iraqi people as a whole. Throughout the government, standards of efficiency must be raised if the manifold organizational and technical problems involved in launching and carrying out a development program are to be solved. Furthermore, the government must be vigilant in anticipating and surmounting the many difficulties that will inevitably arise as economic development gets under way. To arouse the interest and mobilize the enthusiastic cooperation of the people at large, education must be greatly improved along the lines on which particular stress has been laid in this report, namely elementary education for the children, vocational education for the farmers, industrial workers and artisans, and fundamental education for as many adults as possible. Success is impossible with a passive population. Individual Iraqis must be given through the press, the radio, and other media an understanding of what the government is trying to accomplish and how they themselves can contribute to the attainment of the objectives. They must also realize their stake in the program in the form of a rising standard of living and a hope for a better future for their children. Development is a truly individual as well as a national effort. Only in this way is there a guaranty that it will redound to the national welfare.

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APPENDICES

[Pp. 101-102 CONTAIN NO TEXTUAL MATERIAL.]

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APPENDIX A

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List of the Mission's Recommendations

A. *Irrigation and Drainage*

1. Construction of the Bekhme dam on the Greater Zab River in addition to the water reservoir and flood control schemes already comprised in the Development Board program, including the Habbaniya and Wadi Tharthar projects and the Derbend-i-Knan and Dokan dams.

2. Postponement of the final stage of the Habbaniya project until drainage facilities for the Lower Euphrates Valley have been installed and the possibility of alternative storage capacity on the upper Euphrates has been explored.

3. Negotiation of agreements with Syria, Turkey and Iran on afforestation and other anti-erosion measures in the watersheds of the Euphrates and Tigris and their tributaries, and where appropriate, on the utilization of their waters.

4. Prompt execution of a comprehensive drainage program for existing irrigated areas, with priority for areas commanded by the Hindiya barrage and the Dujaila project; payment of part of the cost by beneficiaries of the scheme.

5. Reduction of wasteful use of existing water supplies not only by installing drainage facilities but also by providing the lower Tigris and Euphrates as well as the Gharraf canal with more control works and by ascertaining through experimentation the optimum amounts of water that should be used for every crop.

6. Substantial increases in the current expenditures of the Irrigation Department to insure improved maintenance and operation of existing irrigation systems.

7. Stricter control over the distribution of water by irrigation officials assisted by local committees of farmers.

8. Re-examination of ancient water rights belonging to particular lands and assurance through appropriate legislation of rights of water passage over lands of other property owners.

9. Encouragement of small irrigation schemes based on small streams, springs or wells, in the North.

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B. *Agriculture and Forestry*

1. Reservation of state lands for settlement by small-holders in accordance with announced intentions of the government, subject to (a) further review of proposed size of allotments and inclusion of certain non-farmer beneficiaries, and (b) a requirement that beneficiaries pay part of the cost of settlement.

2. Progressive organization of an extension or advisory service to farmers; immediate appointment of a director responsible for recruiting and training personnel for such a service.

3. Progressive organization of an adequate research and experimental department to support the extension service; immediate appointment of a director to coordinate existing research and lay the foundations for a full time research staff.

4. Encouragement of more extensive use of fertilizer and cultivation of soil-building and forage crops; adoption of appropriate temporary financial incentives to this end; study of extent to which existing sharecropping systems makes achievement of this end difficult.

5. Combatting livestock disease and mortality through provision of livestock shelters in the North, establishment of sheep-dipping stations, an increase in the number of veterinarians and diagnostic facilities, assignment of trained veterinarians to nomadic tribes, and provision of more water-holes.

6. Improvement of livestock through encouragement of better feeding, reseeding of natural pastures in the North and stipulation of rotational grazing, introduction of improved sires and establishment of government stud stations.

7. Increase in the paid-in capital of the Agricultural Bank to ID 2,000,000.

8. Active encouragement and promotion of agricultural cooperatives, supported by adequate credit facilities, in order to facilitate acquisition of better seeds, tools and draft animals and common ownership and operation of irrigation pumps and agricultural machinery; establishment of such cooperatives as an integral part of every new settlement scheme; transfer of responsibility for cooperatives to Department of Agriculture and prompt training abroad of a number of officials in cooperative techniques.

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9. Continuation of Agricultural Machinery Administration, but with some increase in machinery rentals in order to reduce existing budget deficits; state encouragement of local shops for repairs of agricultural machinery to supplement centrally located repair facilities.

10. Establishment of numerous small concrete or corrugated steel grain storage sheds with an aggregate capacity of about 75,000 tons in addition to projected Basra silo.

11. Improvement in the quality of tobacco by engaging a number of foreign experts (a) to work with farmers in bettering methods of growing, picking and curing, (b) to train tobacco graders, and (c) to approve tobacco for Monopoly purchase; replacement of existing tobacco warehouses with four or five new ones provided with dust-extracting plant and humidifying equipment; organization of the Tobacco Monopoly as a fiscally autonomous agency; virtual elimination of the spread between the Monopoly's buying and selling prices, compensated by higher excises payable by manufacturers; lifting of the restriction on the amount of Monopoly purchases per licensed unit of area.

12. Postponement of introduction of beet sugar cultivation until further testing of comparative merits of beet sugar and cane sugar and their merits in relation to other competitive crops.

13. Carrying out the recommendations of the British expert's report on forestry already received by the Iraq government; appropriate emphasis on the planting of windbreaks in the plains and on farmers' woodlots in the new land settlement schemes; establishment of a Department of Forestry independent of the Department of Agriculture.

14. Establishment of a Ministry of Agriculture and Land Use as a more effective means of organizing the government's activities respecting agriculture and forestry.

C. *Industry*

1. Early consideration of a government-financed chemical plant at Kirkuk to produce, from waste oil-field gas and gypsum, ammonium sulphate fertilizer, cement, sulphur and carbon black.

2. A gradual increase in the paid-in capital of the Industrial

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654* Bank by ID 5,000,000 to enable it to assist private enterprise in (a) expanding existing industries such as cotton textiles, vegetable oil extraction and soap making, shoe manufacturing and the fabrication of aluminum utensils, and (b) establishing new plants for the production of bonemeal fertilizers, small steel products from scrap, irrigation pumps, automobile tires, date boxes and perhaps ultimately glass containers and paper; appointment of a foreign industrial expert as head of the Bank's Industrial Schemes section.

3. Encouragement of small industry; establishment of a small-business branch in the Industrial Bank to this end.

4. Core-drilling of indicated deposits of copper, iron, zinc, chrome and salt in order to establish their size and quality before undertaking commercial exploitation.

5. Review of existing legislation and practices with respect to the protection of industry to ensure that special protection and benefits are granted on a temporary and declining scale and are generally restricted to industries ultimately able to withstand foreign competition.

6. Organization of the government's promotional activities relating to industry into a Department of Industrial Research and Standards with responsibility for research and laboratory work, and a Department of Industries with responsibility for the commercial and economic aspects of industry.

7. Greater attention to workers' welfare as a means of increasing labor productivity; stricter enforcement by the government of existing minimum labor standards.

D. *Transport and Communications*

1. Execution of the ten-year highway construction and surfacing program recommended by an interdepartmental committee, with first priority to the Baghdad-Kut-Amara-Basra and the Baghdad-Kirkuk-Mosul roads.

2. Supplementing the main highway program with ultimately 8,000 kilometers of secondary and feeder roads.

3. Institution of controls over road transport, providing for regular inspection of vehicles, limiting permissible loads, requiring

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insurance and licensing operators, to ensure regularity and reliability of service. 654*

4. Gradual conversion to diesel traction on the railways; carrying out necessary replacement of track and rolling stock; completion of Baghdad-West railway station and new railway layout but on a drastically modified basis.

5. Early study of standardizing the railway gauge with a view to completing a standardization program within six years.

6. Study of the railway rate structure, particularly with a view to the removal of certain anomalies.

7. Dredging of a new channel across the Fao bar by the Port of Basra with the financial assistance of the Development Board.

8. Improvement of the Basra and Baghdad airports to meet the specifications of Class B airports.

9. Improvement of the municipal bus service in Baghdad through standardization of equipment, establishment of central garages and modernization and re-equipment of the central workshop with financial help from the Development Board.

10. Transfer of the capital outlays for telephone and telegraph communications to the budget of the Development Board.

E. *Public Health*

1. Greater emphasis on measures to prevent disease such as,
   (a) Introduction of social medicine as a subject in the medical school and appropriate instruction of medical auxiliaries, particularly nurses;
   (b) More effective teaching of personal hygiene and sanitation in schools, the army and the police, and by such means as films, lectures, "health weeks", and the like;
   (c) Organization of a sanitary corps;
   (d) Establishment of one school for training village midwives and another for training town midwives;
   (e) Expansion in the number of village dispensaries and their use as health centers with specially trained medical assistants in charge.

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2. Energetic prosecution, in close cooperation with the Irrigation Department, of the campaign against malaria, bilharzia and hookworm; for this purpose, appropriation of adequate funds to the Institute for Endemic Diseases and equipment of a number of mobile dispensaries.

3. Modernization, extension and replacement of existing hospitals before construction of additional hospitals.

4. Expansion and improvement of the medical auxiliary staff in hospitals; establishment of schools for practical nurses in each province; inauguration of special training courses for medical assistants, radiographers, laboratory assistants, storekeepers and physiotherapists.

5. Packaging of "household remedies" for sale at reasonable prices in village shops remote from pharmacies and dispensaries.

6. Appointment of an experienced public health administrator, assisted by an epidemiologist and a sanitary expert, to advise the Minister of Social Affairs on the organization and further development of health services; greater decentralization of public health administration, with assignment of more responsibility to the chief medical officer in every province who would need to be a full-time, adequately paid official, equipped to carry out his duties.

F. *Community Planning and Facilities*

1. Ultimate establishment of a Community Planning Office in the Ministry of Interior, with the strengthening of the existing planning section in the Department of Municipalities as the initial step; use of this agency in coordinating development projects on the community level under the overall control of the Development Board.

2. Ultimate establishment of a Housing Authority in the Ministry of Social Affairs, with the strengthening of the housing section in the Department of Labor as the first step; provision of this Authority with a Housing Fund.

3. Establishment of an Applied Building Research Station under the proposed Department of Industrial Research and Standards to develop the best and most economical techniques and materials for housing.

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4. Rehousing of *sarifa* dwellers and other slum dwellers through self-help measures, with the government providing the site, water and other necessary facilities and one or two elements of the house and the people affected building their own houses or huts in accordance with specified models.

5. A modest program for public housing pending a more careful survey of housing needs, with special emphasis on the accommodation of government employees in the provinces.

6. Improvement of mortgage credit facilities by increasing the paid-in capital of the Mortgage Bank to ID 1,500,000 and permitting the Bank to loan money for longer terms.

7. Location of new villages away from streams, wherever possible, to prevent water pollution; encouragement of self-help in building village latrines and community centres; allocation of funds to provide safe village water supplies.

8. Construction of a sewage system in Baghdad.

9. Carrying out the five-year program drafted by the Deparment of Municipalities to provide or extend urban water supply systems.

10. A program, involving the installation of 10,000 kw in thermal generating capacity, to provide or expand electricity to municipalities outside of Baghdad, Basra and Kirkuk, coupled with steps to insure the efficient management of such municipal plants through a competent private firm.

G. *Education*

1. Gradual introduction of compulsory primary education over the next 15 years, with emphasis on the training of the necessary teachers in the first five years; some increase in the present school building program with this in view.

2. Special emphasis, in the normal development of schools beyond the primary stage, on the establishment of intermediate and secondary schools in rural areas to provide candidates for rural teachers training colleges.

3. Establishment of a Division of Fundamental Education in the Ministry of Education to carry out a progressively expanding program for adult education over the next fifteen years.

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4. Fundamental revision of the content of education with more emphasis on practical instruction in health, agriculture, animal husbandry, handicrafts, and similar subjects.

5. Improvement in the staff and revision in the curriculum of the government secondary agricultural school and the higher agricultural institute at Abu Ghuraib.

6. Establishment of apprenticeship programs to provide on-the-job training to labor and foremen from the ranks, with supplementary training to be supplied by technical schools.

7. Review of the curriculum and general adequacy of the secondary commercial school and the College of Commerce and Economics with the help of advisory committees of representatives of leading banks and business houses; establishment of additional secondary commercial schools as soon as more teachers can be found; greater emphasis on practical training and on cost accounting in the College of Commerce.

8. Participation by the Development Board in the framing of programs for educating Iraqis abroad.

9. Greater continuity in education policies and programs by ensuring more permanent tenure to high officials in the Ministry of Education and establishing a Statutory Board or Council of Education.

H. *General*

1. Appointment of a commission, assisted by two foreign experts, to make a complete survey of the sytem of public administration and recommend improvements.

2. Appointment of Secretaries to function as the permanent heads of the ministries immediately under the responsible ministers.

3. Interim increase in government salary scales pending final recommendations by the suggested commission on public administration.

4. Fullest possible use of foreign technical assistance in carrying out the development program; central coordination of requests for foreign technical assistance; attachment of a small corps of technicians to the Development Board.

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5. Fullest possible gearing of the entire government into the planning and execution of the development program under the overall coordination and direction of the Development Board.

6. Appointment of an economic adviser to the Development Board to assist the latter in analyzing the economic aspects of development projects and in determining priorities in the light of particular bottlenecks which may develop.

7. Early analysis of the labor requirements of the development program.

8. Mobilization of more and better information that would help in the allocation of resources, the choice of priorities and the determination of the economic impact of the development program; to this end merger of the Directorate-General of the Census and the Principal Bureau of Statistics into a single statistical agency, establishment of a special section on agricultural statistics in the Ministry of Agriculture and expansion of the Department of Labor in the Ministry of Social Affairs.

9. Consideration of ways and means of liberalizing imports as a means of curbing future price increases resulting from the impact of the development program.

10. Avoidance of ordinary government budget deficits, and curbs on expansion of bank credit except for the financing of growing trade.

11. Appointment of a high-level committee consisting of responsible representatives of the Development Board, the National Bank and the Ministries of Finance and Economics to watch the economic and financial repercussions of the program with a view to recommending timely measures to check dangerous inflationary trends.

12. Revisions in the tax structure in the direction of greater equity, principally by lowering import duties on necessities, offset by excises on luxuries, by gradually reducing and perhaps ultimately abolishing the *istihlak* except on exports and by reintroducing a tax on cultivable agricultural land.

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APPENDIX B

Suggestions for Technical Assistance*

Field of Operation and Type of Expert	Minimum Number
I. Agriculture and Animal Husbandry	
Tobacco	
Specialists in production to work with farmers	2
Grader	1
Manipulators	2
Buyer	1
Adviser to head of Monopoly	1
Other Agriculture	
Director for proposed Extension Service, assistant and field supervisors	5
Director for proposed Research Department and director for section on field crops	2
Sugar beet research expert	1
Cane sugar research expert	1
Teachers for Abu Ghuraib agricultural school	2
Livestock	
Abattoir specialist	1
Expert for Hides and Skins Association	1
Wool-shearing and grading experts	2
Adviser to veterinary services	1
Veterinarians for field service	5
Director of Veterinary Serum Institute	1
Agricultural Machinery Administration	
Maintenance experts	3
II. Irrigation	
Additional supervisory engineers for drainage and irrigation	2

* Exclusive of managerial and technical personnel for industrial enterprises.

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III. Industrial Bank	
Chief of Industrial Schemes Section	1
IV. Transport	
Railway rate expert	1
Experts to study and plan gauge conversion	Subject to examination
V. Public Health	
Midwives to set up training courses	3
Additional nurses	37
Expert to organize sanitary corps	1
Advisory group for Ministry (public health administrator, epidemiologist and expert on sanitation)	3
VI. General	
Experts on public administration and personnel	2
Economic adviser to Development Board	1
Corps of specialists for Development Board	6 - 8

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APPENDIX C

Statistical Organization

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In the body of its report, the Mission has advocated the strengthening and reorganization of the statistical organization of the government. Statistics have, on the whole, been a neglected function of the government, although foreign trade statistics have been collected and published efficiently by the Statistics Division of the Customs Department and a long step forward was taken in 1947 with the country's first census of population. When the Mission was in Iraq, the Principal Bureau of Statistics operated as hardly more than a collecting agency with no actual authority over the statistics it collected. Its staff, though willing and hard-working, was clearly inadequate to review critically the statistics it published or to take the initiative in developing new and useful sources of information. In fact, the senior staff of the Bureau have usually been transferred to more lucrative government posts or have themselves resigned to go into private business.

As a result, the annual Statistical Abstract is an unsatisfactory document. It omits useful information which could be collected without too much difficulty; it includes much unnecessary detail and some statistics of highly dubious value; and the same mistakes have tended to be perpetuated year after year. The Mission found a widespread and usually justifiable distrust of published statistics, especially agricultural statistics, which sometimes led those who had some use for statistical data to try to collect their own.

The Mission believes that the rapid improvement of the statistical organization is a task which should be undertaken without delay. In many fields individual judgment can be no substitute for carefully compiled statistical data. As the development program proceeds, more and more occasions will arise when such data will be needed by the Development Board, and especially by its prospective economic adviser. Without adequate statistics, it will be far more difficult to follow the progress of the program in fulfilling its ultimate objective, raising the standard of living of the people, and it will often be necessary to take decisions on the basis of guess-

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work. Lack of funds may have been the reason for neglect in the past, but it need be no obstacle in the future.

A detailed report on the statistical organization, with which the Mission is in general agreement, was published in 1948* and an experienced statistician has now been appointed to take charge of the Bureau. In these circumstances, the Mission does not wish to do more than note a few general recommendations and to stress the importance of building up the Bureau into an efficient service organization for the whole government, which can offer an attractive career for its staff.

The Need for Improvement

Perhaps the best way of illustrating the kind of improvement that is necessary is to consider the principal attributes which good statistics should have and to give examples of how statistics in Iraq meet these tests. Probably the most important quality is reliability. This does not mean 100 percent accuracy, which is normally impossible. There will be limits of accuracy, varying according to the subject matter, which can be aimed at but cannot reasonably be exceeded. What is important is that the degree of accuracy, which any particular group of statistics is believed to have, should be clearly and honestly stated. Even very rough statistics can be useful, provided that the user knows their limitations.

Since more than half of the people live off the land, data on the land and its vital complementary resource, water, are of paramount importance. Today, agricultural statistics are collected haphazardly by officials with little training and little transport. Even so, the existing statistics could easily be improved by using a few simple forms and by a little checking of the results from year to year. As it is, they are published without any qualification. The published statistics of the area under cultivation by crops may be cited as an example. These statistics are computed in several ways. Some, mainly those for pump-irrigated land, are supplied by the Irrigation Department. Others are calculated on the basis of seed sown which is often the only measure the fellah knows. However, the published statistics of seed sown and area cultivated are

* John Murray, *A Report on Statistical Organization of the Kingdom of Iraq*. Government Press, Baghdad, 1948.

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obviously based on a fixed rate of seed per donum (e.g. 15 kg. for wheat, 20 kg. for rice and barley) which has been applied regularly in almost every year. Yet the rate of seeding undoubtedly varies from one part of the country to another. An explanation of the methods of computation, of the reasons therefor and the degree of reliance that can be placed on them are certainly called for.

Again, population statistics have been published for each province, based on a hand-count of the census results. The fact that these published figures contain an estimate for nomads might well be stated. A more important omission is an explanation of the very marked discrepancy between men and women. It is well-known that there is strong tendency in many parts of the country to record male children as female and the returns for the lower age groups confirm this in a striking manner. At least some preliminary note on how this affects the validity of the results would be advisable. A good example of an appropriate warning is the qualifying note introducing the vital statistics which have been published.

Closely allied to reliability is clarity of definition. It is not possible to use statistics properly, if it is not clear what they mean. As an example of this, the figures for cultivable land made available to the Mission and shown in Table 2 of Annex A may be cited. If definitions are not clear, a series of statistics may lack continuity. An example of this is the published figures for electricity consumption in the various provinces, which are divided into three groups—lighting, manufacturing and other purposes. It is not clear what "other purposes" means. Moreover, although the definition evidently changed in Mosul between 1945 and 1946, no explanation is given and no adjustment has been made. In general, too, a number of units of weight or capacity, such as the *mann* and the *hukka*, are used in the Abstract without stating their equivalent in more standard units. The fact that these units vary from one commodity to another and, it is said, from one city to another makes it all the more necessary to state the precise equivalent in the context used.

Statistics should also be properly selected. If statistical publications are not to become a mass of unwieldy detail, a proper balance has to be struck between what is to be included and what is to be excluded. The Abstract, at present, contains much detailed medical and legal data of a somewhat specialized nature. On agri-

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culture, on the other hand, there are only global figures for the country as a whole, although data by provinces and even by smaller units such as *qadhas* and *nahiyas* is available. In spite of the poor quality of these statistics, such detail might be extremely useful and would, incidentally, make it easier to assess their reliability. Again, the revealing data on landholdings available in the Directorate-General of Land Settlement, which appear in Table 4 of Annex A, have not been included. No attempt has been made to collect statistics of industrial production, although in the more modern industries, at least, this would be simple.

An example of another type of poor selection can be found in the long list of wholesale prices published in the Abstract, which are obtained from the Baghdad Chamber of Commerce. Prices are given for such commodities as cardamom and garlic, but none for cotton textiles, which are by far the most important commodity imported into Iraq and prices of which are regularly quoted by the Chamber of Commerce.

Statistics should be also as uniform as possible to insure comparability. For instance, common definitions should, as far as possible, be used by the Customs, the Directorate-General of Imports and the railways in classifying imported goods. In fact, the machine tabulation of the statistics of the Customs and import licensing department could easily be combined, thus saving time and gaining uniformity. As another example, when statistics of industrial production are available, industrial definitions and coverage should, as far as possible, be uniform with those of the Labor Department.

Finally, statistics should be made available as soon as possible, so that the earliest use can be made of them. Apart from printing delays, much of the latest information that is eventually published in the Abstract is held up until other information for the same year becomes available.

Specific Recommendations

1. Full implementation should be given to the Law of Statistics—No. 42 of 1939, giving the Principal Bureau the right of supervision over all statistical data in the form it prescribes.

2. As recommended in the body of the Mission's report, the functions of the Directorate-General of the Census should be trans-

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654* ferred to the Principal Bureau of Statistics as soon as possible. The Principal Bureau of Statistics should then be made responsible for the execution, with the assistance of appropriate ministries, of all censuses, including agriculture, industry, distribution, etc. These are essentially statistical functions. Moreover, it is important to bring together the available talent so as to make the statistical organization as flexible as possible.

3. The Principal Bureau of Statistics with its Census division should be housed as soon as conveniently possible in the same building with the Statistics Division of the Customs. Apart from other obvious conveniences, this would bring all the tabulating machines together. At present, some machines are used to capacity, while others stand idle. In choosing the building due regard should be paid to the importance of a location close to the agricultural statistics section of the proposed Ministry of Agriculture.

4. In view of the importance of agricultural statistics, the agricultural statistician requested from FAO should be appointed for a period of not less than two years.

5. In order to make statistics available as quickly as possible, a new quarterly Bulletin of Statistics should be published in Arabic and English, if possible within the next year. The Bulletin would have two principal sections:

(i) regular statistics, principally for foreign trade, balance of payments, finance, prices, transport and production. Data would be included up to the latest date for which they were available at the time of publication.

(ii) occasional statistics or statistical studies. These should only be included as suitable opportunity occurred. Examples would be census data on particular provinces as they become available. A cumulative index should be provided for this part of the Bulletin.

The Bulletin need not, and, in fact, should not start on an ambitious scale. In the first instance, it should contain only such statistics as the Bureau has been able to analyze and for which it can give accurate definitions and a reasonable estimate of numerical accuracy. As other statistics meet these tests, they may be included. Such a bulletin should not require much additional

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work, as the statistics included would ordinarily be collected for the Abstract.

6. A schedule should be drawn up for the stage-by-stage growth of the staff and equipment of the Principal Bureau in accordance with the assumption of broader functions. In accordance with this schedule, efforts should be made to order equipment and to train or hire from abroad suitable staff.

7. Particular attention should be paid to the selection of a special assistant to the head of the Bureau to direct a small special section which would concentrate on developing and checking new sources of statistics. The Mission found that there was much untapped information in government files. As soon as new sources of data are developed satisfactorily, the collection and calculation, if any, could be turned over to appropriate sections of the Bureau. A particular task of this special section would be to lay the groundwork for future development of national income statistics. In this task as much advantage as possible should be taken of experience in other parts of the Middle and Far East, for example, in India and in Turkey. Much might also be learned from the research now being carried out on the agriculture income of Syria and the Lebanon at the American University at Beirut.

This assistant would require high qualifications and should have considerable personal initiative. It is essential that only a candidate of high caliber should be chosen. Preferably he should be of Iraqi nationality, but if one is not found within, say, a year, it would be better to hire a foreign statistician with suitable qualifications on a short contract than to appoint an unsuitable candidate.

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ANNEXES

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[Pp. 121-122 CONTAIN NO TEXTUAL MATERIAL]

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ANNEX A

BASIC FACTORS AND CONDITIONS

I. The Regions

131 Iraq, a country with a population of approximately 5,000,000 and an area of 168,040 square miles, forms roughly a triangular area with the base running southwest to northeast and the apex 133 terminating at the Persian Gulf. It is dominated by two great river systems—the Tigris and the Euphrates. The Euphrates rises in the mountains of Turkey, flows across the Northern Syrian plateau and then meanders through Iraq, receiving little additional water from tributaries. The Tigris also rises in Turkey, but further to the east and north. It enters Iraq in Mosul province and receives important accessions from the Greater and Lesser Zab Rivers which are fed from the snows and the rains of the mountains along the Turkish and Iranian borders and, to a lesser degree, from the Diyala River. Downstream from Ramadi on the Euphrates and Baghdad on the Tigris the two rivers form a single low-lying alluvial valley built up as a delta into the Persian Gulf. As they flow south, the rivers are virtually lost in the marshes and lakes of southern Iraq, their remaining waters uniting at Qurna to flow as the Shatt al Arab into the Persian Gulf.

311 Only a relatively narrow belt, lying north-northeast of a line roughly running south of Mosul and Kirkuk to Khanaqin near the Iranian border, has sufficient rainfall to permit the cultivation of winter crops without irrigation. In the rest of the country, agriculture depends upon the water of the two rivers for irrigation, whether by pump, by flow or by natural inundation. With the exception of the large and remote southern and northern deserts and the greater part of the rolling uplands between the Tigris and the Euphrates known as the northern Jezireh, most of this region can be cultivated once water is made available. With storage and regulation of the river waters, a great extension of the area under cultivation is possible. Without regulation, on the other hand, the

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311 waters of the twin rivers are largely wasted and periodically unloosen disastrous floods upon Baghdad and the alluvial plain to the south.

The Rain-fed Zone

241 438 In the upland plains of the rain-fed zone stretching from Northern Mosul to Suleimaniya, wheat and barley are the principal crops. Rainfall is generally inadequate for summer crops, although water from streams and springs permit cultivation of rice and cotton. In part of this area, especially Northern Mosul, there has been a rapid extension of cultivation with the help of modern agricultural machinery.

233 438 241 To the north and northeast lie the mountain massifs of Iraq. Here the raising of cattle, sheep and goats by Kurdish nomads is one of the principal occupations. The mountains are largely barren of trees but offer natural pasture for animals. In the valleys and on hillsides grain, tobacco, timber and fruit are grown. Tobacco, although small in area, is an important cash crop.

438 433 [315] Except for some handicrafts, there is little native industry in this region. Mosul, the second largest city in Iraq, is principally a commercial center, and an outlet for exports to Syria and Lebanon. Kirkuk, however, is the center of most of Iraq's petroleum production and one of the largest and richest oil fields in the world. Oil fields of subsidiary importance also exist at Ain Zaleh in Mosul province and near Khanaqin in Diyala province. The mountains of the North may ultimately yield other minerals such as copper, chrome and iron.

The Irrigation Zone

133 311 South of the rain-fed zone the river valleys may be divided into three major regions: the upper river valleys; the lower river valley down to Amara and Nasiriya; and the triangular area from Nasiriya and Amara to the mouth of the Shatt al Arab.

The first of these regions includes most of the northern Jezireh and the area north of Baghdad and east of the Tigris. The latter area still awaits irrigation for the most part, and the Jezireh is hardly susceptible to irrigation because of the elevation and configuration of the land. The Jezireh is an upland plateau

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relieved by low ranges and depressed areas of which the major one is the Wadi Tharthar. It is sparsely inhabited by pastoral nomads although in the North some settled farming, made speculative by irregular rainfall, is carried on.

The second region, extending downstream from Ramadi on the Euphrates and Baghdad on the Tigris and including the Diyala River Valley, is the area where most irrigation projects have been carried out in the past. Pump irrigation predominates on the banks of the three rivers where the land is high and water is easily accessible. For the more remote areas flow irrigation is provided by canals dependent on the Hindiya barrage on the Euphrates, the Kut barrage on the Tigris and the Diyala weir on the Diyala River. Here flow irrigation between the two main rivers is facilitated by the fact that in the Baghdad region the Euphrates is higher than the Tigris, while below Baghdad the Tigris is above the Euphrates. In this region barley is the principal winter crop, followed by wheat. Summer crops are limited by lack of water, but among them cotton has become in recent years by far the most prominent, leaving sorghum, sesame, green gram, corn and millet far behind. Fruit culture is important. Dates are widely grown, both for domestic consumption and for export; and the Diyala Valley in particular produces excellent citrus fruit. Rice is an important crop between Nejf and Diwaniya on the Euphrates and around Rumaitha farther down the river. The country's major concentration of population lies in the region comprising the district about Baghdad and the provinces of Hilla, Kerbela and parts of Kut and Diwaniya. It includes the capital, Baghdad, a city with a population of 550,000 and the leading commercial and industrial center of the country.

The third region—the Basra, Nasiriya, Amara triangle—is generally one vast marsh during the spring floods. Here the rural dwellings are of reeds and brushwood, in contrast to the rest of the country where mud huts and, in the mountains of the North, stone houses predominate. Rice grown in the naturally inundated marshland is the staple food, varied by fish; and the water buffalo is the prevailing type of livestock. Here also is the world's largest date palm belt stretching along both sides of the Shatt al Arab and contributing one of Iraq's principal exports. Basra, Iraq's only port, is the largest city of this region and handles most of the country's foreign trade.

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438 country's foreign trade. Near it is the country's second largest oil field.

133 211 233 To the south and southwest of the irrigation zone lie the vast arid tracts known as the southern and northern deserts which comprise about 40 percent of the land area of Iraq. These are sparsely inhabited by roaming nomads who raise camels, goats and sheep and annually take their flocks into the river valleys in search of summer pasture.

II. The People

161 The first official census of the settled population in Iraq was taken in 1947 and preliminary statistics on the male and female population of each province have already been published.[1] The preliminary estimate of the enumerated population was approximately 4.6 million. This figure has been brought up to 4.8 million in the published statistics by adding a rough estimate of 200,000 for the nomads in Mosul province and in the provinces along the Euphrates. Like all other countries at a similar stage of development, Iraq has a very young population, about half being under the age of 20. Although no reliable vital statistics are available, all indications point on the one hand to a very high rate of mortality among infants and young children, and on the other, to a correspondingly high birth rate. Even under the present poor health conditions the population seems to have been increasing at a rate conjectured to be in the region of one to one and a half percent per annum. Whatever the present rate, however, it is clear that, if full advantage is taken of the ample opportunity to improve health

[1] Considering the attendant difficulties, this census may be judged a success. The information about the people of Iraq which it has already yielded and, more especially, which it can yield when tabulation is completed, is without doubt far more reliable than any estimates previously made. However, as with most first attempts at census-taking, the results have to be interpreted with great caution. Besides the figures already published, the Mission had access to certain unpublished data on four provinces—Baghdad, Mosul, Kirkuk and Basra. Much of the description of the population which follows is based on this data, but it must be noted that, although allowance was made for the fact that these four provinces are a most imperfect cross-section of the country, this fact is an additional limitation to the validity of any but the broadest conclusions.

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conditions in the future, the rate could rise to two percent per annum or even higher within a comparatively short period. Obviously this possibility will have to be borne in mind in planning the development of social services such as education and housing. It also has important implications in agriculture. As the limited supply of water is more fully utilized, most of the increase in population may ultimately have to be absorbed in nonagricultural pursuits, unless water is used much more efficiently than it is now.

As the standard of social services such as health and education is higher in the cities and the opportunities for employment are more varied, the distinction between urban and rural population is an important one in considering the age and sex distribution of the people, their occupations and their standard of living. About 550,000 people live in the municipality of Baghdad, another 300,000 in the next three largest cities of Mosul, Basra and Kirkuk and some 350,000 in other towns having a population of over 15,000. Thus about 1.2 million people or a quarter of the population live in sizeable urban communities. In addition, there are about a hundred smaller municipalities having an aggregate population of under half a million. These towns are usually the administrative and market centers of the minor political subdivisions such as *qadhas* and *nahiyas* and many of them are little more than large villages; in many respects they form a semirural category intermediate between the larger towns and the villages.

There has been a strong migration from the country to the cities in recent years, particularly during the last war. The most striking examples of this can be seen in Baghdad and Basra where many thousands of "squatters" from Amara province are crowded together in makeshift huts under extremely unhygienic conditions. The peculiarly adverse conditions of life in Amara have made that province the principal source of migrants to the large cities and, indeed, to most parts of the country, but there has evidently been a substantial movement from the rural areas in general. As it is prima facie likely that these migrants would consist principally of young adults or adolescents, especially men, it is not surprising to find that the census shows a much higher proportion of the very young (under 10) and the old (over 50) in the rural areas, the disparity being even more marked among men than among

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162 women. The census returns, in fact, record an extraordinarily large excess of women over men in some parts of the country—e.g., 57 percent in the three rural *qadhas* of Muntafiq province—but there is good reason to believe that such figures, while indicative of the true position, are generally exaggerated.

Occupation

162 463 The major occupation is agriculture and animal husbandry. Nearly two thirds of the people live in the rural villages. As handicrafts are rarely found in the villages and only a few people are absorbed by such secondary occupations as trade and transport, it is likely that 85 to 90 percent of the rural population lives directly off the land.

Many of the inhabitants of the smaller and even some of the larger towns are also engaged in agriculture. In Tel Afar, a town of 20,000 in the principal grain-growing region of Mosul province, over three quarters of the male population whose occupation was recorded gave it as agriculture. This, however, is probably exceptional and the proportion would, no doubt, be considerably less than half in many smaller towns. Even in the largest cities, there is a smaller but far from negligible proportion of the population employed in agriculture, principally in the production of vegetables, dates and other fruits or in raising livestock for the city market.

In all, the number of people in families whose income is derived directly from work on the land is probably in the neighborhood of 60 percent of the total population. This method of expressing the percentage is used advisedly. A much higher figure could certainly be given for the number of people occupied since most [464] of the rural population is employed to some extent. Unemployment, as opposed to underemployment, is largely an urban problem. In the rural areas the number of men whose occupation was recorded by the census is often nearly as large as the number over [857 889] 10 years of age. This, no doubt, corresponds closely to the facts, since even young children tend flocks and perform other light work on the land while old men help with such tasks as threshing. [462] Women, too, are an important source of agricultural labor, particularly at harvest time, although this is inadequately reflected in the census.

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In the towns, on the other hand, the occupations of a much smaller proportion of the males were recorded. And, moreover, many of those that were recorded fell into various ill-defined categories, which very probably include a large number of the unemployed or the unproductive (e.g., school children). There is, also, far less opportunity for work by women in the towns.

The estimate of 60 percent for the agricultural population would leave rather less than two million people in the families of those employed in other occupations. In this sector the labor force may be estimated at about 400,000 to 450,000 men and some 30,000 women or about 450,000 in all, with a considerable margin of error on either side. Some idea of the distribution of these workers is given in the following table.

TABLE 1

NONAGRICULTURAL LABOR FORCE
(in thousands)

Commerce	110
Personal and public service	70
Manufacturing and handicraft	75
Transport	45
Government (including police)	55
	355
Other categories; errors and omissions	95
	450

This table, which is necessarily a compound of industrial and occupational classifications and consequently contains a few duplications, must be interpreted as only a rough estimate giving broad orders of magnitude.

After agriculture, commerce is certainly the most important occupational group; the census records nearly 50,000 (including a few women) in the four largest cities alone. There is probably at least an equal number in the rest of the country, since one of the main functions of the smaller towns is to serve as centers of retail

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trade for the surrounding countryside and as collection centers for its produce. Even in the smallest towns rows of small shopkeepers' booths can be seen and the larger towns usually have extensive bazaars.

Private and public service is another important group of occupations. Besides domestic service it includes such occupations as laundering and catering, the latter a not unimportant category in a country where the coffee-house is a center of social activity. In the four provinces for which data is available, there were 45,000 (of which 6,000 were women) in this group. The estimate given above does not seem excessive for the country as a whole.

A more detailed classification of workers employed in manufacturing will be found in Table 7. This table is based largely on statistics of workers employed in factories which have been compiled by the Labor Directorate from returns by factory inspectors. These figures are, however, acknowledged to be incomplete, particularly as regards the large numbers of handicraft workers who are self-employed with one or two assistants. From the census data it is evident that there are a large number of additional workers occupied in woodworking and allied occupations (e.g., working with palm leaves or reeds) and in tailoring or dressmaking; some addition would also have to be made for jewelry and textile workers. The figure of 75,000 given here includes an estimate for these additions.

The estimate for transportation, which includes all employees of the railways and the Port of Basra, is a particularly rough one. It is believed, however, to be of the right order of magnitude. The figure for government workers is reasonably accurate, although it may duplicate to some extent workers in other categories already specified. The residual figure, of course, is subject to an extremely wide margin of error. It includes all categories not mentioned elsewhere such as construction workers and the professions insofar as they are not employed by the government.

Literacy

The acquisition of skill is severely limited by lack of education. Education is, as the monograph on that subject shows, broader than the mere ability to read and write, but the degree of

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literacy in the country is a fair guide to the extent to which the Iraqi can be considered educated. According to the census, which recorded the literacy of all those of five years of age or over, literacy in Baghdad among males over five was over 40 percent; in the smaller towns of the province it was about 30 percent and in the villages only 10 percent. These figures are probably well above the average. Cities like Basra and Kirkuk have a male literacy nearer 30 percent, but in many rural *nahiyas* it is five percent or less and in the remoter *nahiyas* of the North as low as two percent.

Literacy is much lower among women than among men. In the cities of Baghdad and Mosul, the proportion of literate females over five was about 20 percent (about half that of the males). Outside of the larger cities, however, female education hardly exists. The proportion of female literates in the rural areas and the smaller towns of Mosul, Kirkuk, Basra and Baghdad provinces barely exceeds one percent.

It is not known how literacy was defined in the census, but even if these figures represent a real ability to read and understand rather than a smattering of education, it is clear that illiteracy is a great handicap to even the simplest form of written instruction. In industry this is apt to put a heavy burden of detailed work on the management of a factory. In agriculture it gives little possibility of supplementing the limited amount of oral instruction or visual demonstration which the present agricultural service can render.

III. The Standard of Living

No systematic estimate of the national income has yet been made. A rough estimate by the Statistical Office of the United Nations put the income per head in 1949 at $85. The equivalent in dinars would depend on the exchange rate chosen for conversion, which is necessarily an arbitrary choice; at the old rate, it would be about ID 20, at the new ID 30. The Mission attempted to make an estimate of the national product, but the information

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434 511 available to it was often unreliable, if not actually conflicting, amd, in certain fields, data were completely lacking. The attempt was, therefore, abandoned, but it was at least possible to draw the conclusion that the estimate quoted above was approximately correct and that the total income per head probably fell somewhere between ID 20 and ID 30.

511 In any event, a broad estimate of this kind which embraces both the very high incomes of the landowners and the very low incomes of the fellahin can do little more than convey a generalized impression of poverty. While it is not possible to give even a rough idea of the distribution of incomes in statistical terms, some description of the standard of living of the people may be of value.

Agriculture, which is the most important occupation in Iraq, is also the most difficult to describe, conditions being extremely varied and information virtually nonexistent. However, a hypothetical example of the condition of a fellah in the irrigation zone, where barley is the principal crop, may serve as a rough guidle. In this zone a fellah, who cultivates 25 donums of winter crops annually, is probably above the average. Estimates of yields vary enormously, even apart from the annual variation due to water supply. Landowners tend to give a high estimate (e.g., 500 kilograms per donum), because they believe that the fellahin withhold part of the crop in order to obtain a larger share. This is probably true and accounts for the tendency of the fellah to give a low estimate (e.g., 200 kg). Apart from this, the land varies greatly in quality, pump-irrigated land being generally more productive. The fellah, however, gets a smaller share on pump land.

A yield of 300 kg on flow-irrigated land would probably not be much below average, if at all. The total crop on 25 donums would then be 7.5 tons. Of this the fellah would probably get as his share two fifths or three tons, out of which he has to retain seed for the next year and to pay for some help with the threshing and harvesting, in all amounting to one half to one ton more. The balance would thus be two to two and a half tons. His family might consist of five or six people, including himself, his wife and children, and one or two other relatives such as his parents or an unmarried sister. The minimum retained for food would be one ton and, in practice, it is probably more. He would thus have

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little more than one ton left to sell and he might even have to keep part of this for his draft animals, if they are unable to find enough stubble and other natural fodder.

The price which a fellah gets for his grain is usually very much less than the wholesale market price in Basra or Baghdad. Although rail transport is very cheap for grains, the other costs such as local transport, bagging, weighing and storage are high; the merchants' profit and the *istihlak* tax also have to be deducted. Finally, the fellah's funds are usually exhausted before the harvest season and he frequently accepts a low forward price on his crop before it is gathered. For the 1950-51 crop, prices have been high (over ID 20 per ton), but many fellahin undoubtedly sold forward at prices little over ID 10. This would not be an unusual price in past seasons. Thus, ID 10 for the winter crop and perhaps another ID 10 for a small summer crop of sesame would constitute his total cash income for the year.

This income would usually be spent on food, clothing and possibly some low-grade domestic tobacco. Two of the most important items in food expenditure are sugar and tea. Dates, particularly in the South, and a few vegetables such as onions are also purchased, but, on the whole, most fruit and vegetables are beyond the reach of the fellah and are sold in the towns. Meat is only eaten occasionally, although fish is available in the marsh areas of the South. Nor does the fellah who owns no animals other than his draft animals consume much milk or *leban* (sour milk). Clothing would consist of some cheap cotton sheeting sufficient for a few garments and occasionally a second-hand jacket; few fellahin wear shoes. Hardly anything is spent on housing or furniture, the living quarters being a small mud hut without windows and hardly any furnishing but a few mats and cooking utensils. Soap, for example, is undoubtedly a luxury. Life is not far above the subsistence level and must often be below it.

In the process of selling his surplus crop and making his small purchases, the fellah is taxed. While with crops consumed in Iraq the *istihlak* tax is largely borne by the buyer, in the case of an export crop such as barley, which is influenced by world prices, the tax falls most heavily on the producer. At the end of 1950, customs duties on sugar were about one fifth to one quarter of the

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511 651 Baghdad retail price; on tea, about one sixth. Duties on textiles are also high, but cannot be so easily measured in terms of the retail price, while excise and other revenue collected on tobacco are also very large. In the case of barley, these indirect taxes on sale and purchase might reduce the fellah's real income from his saleable surplus by as much as one third.

511 Although the villager contributes to the revenue of the country, he receives little in the way of benefits from its expenditure. He is usually without any kind of education, which in itself militates against the improvement of his position. Thus the average fellah would not be able to read even the simplest leaflets, which might be published to improve his methods of cultivation. Government officials, who might impart this knowledge by personal contact, are too few or too hampered by lack of transport to be able to reach him. Much the same applies to his health, which is generally poor in the first instance because he is unable to afford an adequate diet.

Apart from a few generalizations, lack of information prevents comparison with other types of agriculture such as rice cultivation in the marsh areas of the South, date-gardening along the Euphrates and in Basra or grain-growing in the North. In general, the rice areas appear to be extremely congested and living standards are probably the lowest of all. Land in the North is more plentiful, the smallholder is more common, and, in any case, the share of the landlord is far lower, but rainfall is uncertain and yields vary disastrously from year to year.

There are, of course, fellahin who have additional sources of income. The principal source is livestock. A fellah, who, in addition to working the land, owns a few cows or water buffalo is, by comparison, a rich man, but such people are not common. The capital required to purchase an animal may be several times the annual cash income of the poor fellah. Some may seek casual work during the long off-season, but again these are the minority.

The condition of the settlers in the Dujaila project is in striking contrast to that of the average fellah. The principal reason for their improved standard of living is the fact that they do not have to pay any share to a landlord. Their income is for that reason alone more than double. In addition, they have been able to acquire cows, sheep, goats and chickens. Many of them have fruit gardens.

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As a consequence they have a far healthier diet and are obviously better dressed. In fact, it is not uncommon to find a farmer who himself employs a fellah. Although this is partly a consequence of the large size of his plot (100 donums including fallow), it is indicative of his much higher standard of living.

In the towns, workers with regular employment would be much better off than the poor fellah, but in cities such as Basra and Baghdad where there has been a great influx of people from the country, there is considerable underemployment in addition to unemployment. Although, at the current rate of wages for casual labor (about 200 to 250 fils a day) a man might theoretically earn an annual income of ID 75 or more, there must be many who work irregularly and earn less than ID 50. Bread and rice are comparatively costly and, together with the rent of a room for a man's family, might take nearly half his income.

Wages are probably not much higher in many of the smaller and more primitive industries, but artisans such as plumbers and electricians are scarce and can command much higher wages. In the more modern industries, such as the oil industry, the Port of Basra and the new factories in Baghdad, a skilled machinist can earn a dinar a day or more. On the clerical side, in the lowest grade of the regular civil service a married official with more than one child receives ID 13 per month.

The higher income of the city-dweller with regular employment enables him to purchase a reasonable diet, better clothing and better housing. He also has access to educational and health services. Nevertheless, congestion and sanitary conditions are often very bad in certain parts of the cities and disease is common.

Above these various classes is the small rich group of landowners and merchants. No estimate of the proportion of the national income accruing to this group is possible, but some indication can be gleaned from the fact that a landowner in the South normally gets at least half the net value of the output from the land, while, in industry, profits may exceed the total payroll.

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IV. Natural Resources

Land and Water

312 Aside from oil, water and land may be said to be the principal natural resources of Iraq. Of the two, water is the more critical factor in the country's development. Underground water is generally plentiful, but in parts of the North it is frequently found only at considerable depth and in the central and southern portions, where the water table is high, it tends to be brackish and unfit for consumption. In the two major rivers, however, Iraq possesses a source of abundant water of a quality excellent for irrigation and, with purification, for human consumption. Here the chief problem lies in the marked variation of the flow of the rivers. On the Euphrates the mean monthly discharge of water varies from a low of 293 cubic meters per second in September to a high of 2,235 in May. On the Tigris the variation is even more marked, ranging from a low of 359 in October to a maximum of 2,951 in April. Thus periods of floods alternate with periods of acute scarcity. In the absence of storage facilities and a regulated flow, the limit on the cultivation of crops is set by the current low point in the water supply in the critical growing period for both winter and [134] summer crops. The water problem is further complicated by the fact that continuous use of water for irrigation, coupled with the effect of evaporation in a dry, hot climate, has saturated the subsoil waters with salt and raised the water table, thus precipitating salt which, in the absence of drainage, quickly makes the land infertile. More effective use of the water supply is thus the central problem of Iraq.

311 In relation both to the population and the land actually under cultivation, the amount of cultivable land available in the country is very large. Accurate statistics on the total cultivable area are lacking, but the following estimates based largely on data supplied by the Department of Agriculture give some conception of the magnitude:

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TABLE 2

CULTIVABLE LAND, CROPPED LAND AND LAND IN AGRICULTURE USE
(in millions of donums)

CULTIVABLE AREA		48.1
Irrigation zone	32.1	
Rain-fed zone	16.0	
AREA ACTUALLY IN CROPS		11.1
By area		
Irrigation zone	7.6	
Rain-fed zone	3.5	
By type of crop		
Winter	8.4	
Summer	1.9	
Orchards	0.8	
AREA UNDER CULTIVATION		17.5

These figures would indicate that the area under cultivation, taking into account the assumption that almost half of the area devoted to winter crops is normally left fallow, is only about 36 percent of the total cultivable area. In the rain-fed zone the area under cultivation could theoretically be more than doubled; and in the irrigation zone it could be almost tripled. Unquestionably these figures give a somewhat exaggerated impression for it is likely that the criteria employed in classifying land as cultivable have been rather liberal, but there is little doubt that the area under cultivation can be greatly extended. What would be required in detail to put this additional cultivable land in actual use is not known, but, in the irrigation zone, water and drainage are undoubtedly the prime prerequisites while, in the rain-fed zone, more manpower and machinery may be the principal requirements.

Forms of Land Tenure

Land is held under a complicated system of tenure which has given rise to much confusion and conflict. In accordance with traditional legal concepts the state has retained the ultimate legal title to nearly all the available land. Absolute private ownership, known as *mamloukah* or *mulk*, is confined to urban property and orchards. Rights to the permanent usufructuary possession of a large proportion of state or *miri* land have been acquired by private

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individuals, however, under conditions which are virtually indistiguishable from full private ownership, since the holdings may be sold, mortgaged or transferred to successors. In the past, claims to land were established in most cases quite informally without the benefit of full legal sanction, i.e., by simply occupying the land. Tribal lands were generally regarded as being held in common. As, however, the tribes were converted from nomadic pursuits to settled agriculture, the sheikhs and sub-sheikhs of the tribe gradually established a claim to such lands as their own property and thus became landlords, with their tribesmen as sharecropping tenants.

In the 19th century the Turkish government sought to establish a single legal system of tenure, known as *tapu*, but in the end this effort only compounded the confusion. There were no systematic grants of *tapu* tenure. Grants were generally made without any examination of conflicting claims and were used as a means of rewarding the favored few. The grants that were made at that time to the Sadun clan and a few other influential persons in Muntafiq province remain contested to this day by the actual occupiers of the land. With the introduction of *tapu* tenure many village areas in the North apparently were registered in whole or in part as the personal possession of local notables or *aghas* who in the past had acted as tax farmers and served generally as intermediaries between the government and the cultivators. In the twentieth century a further complication was added by the rapid introduction of pump irrigation. City merchants financially able to buy pumps entered into arrangements with occupiers of *miri* land for the supply of water against specified shares in the crop, thus creating new claims to land without resolving the fate of any pre-existing claims.

Following a study of this question by Sir Ernest Dowson, a British land expert, the government decided in 1932 to end the confusion by inaugurating a cadastral survey to be carried out by a number of so-called Land Settlement Committees. The law of 1932 as well as the law which replaced it in 1938 recognized the following types of land tenure:

— *Mamloukah* or *mulk*—land held in absolute private ownership.
Matroukah—land reserved for public purposes.
Mawqufa or *waqf*—land which is administered in trust (1) for

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the benefit of religious institutions by the state Awqaf Administration, or (2) for the benefit of private persons by *mutawallis* appointed by religious courts. This type of *waqf* must be distinguished from so-called untrue *waqf*, namely property from which the taxes or revenue were in the past assigned to religious institutions by the Turkish government.

Miri tapu—land held in permanent tenure from the state under conditions enabling the holder to sell or mortgage it and leave it to his successors. Proof of such tenure may be supplied by documentary evidence or by factual evidence that the land has been used productively by the holder or his predecessor for 10 years during which no land rent was paid or that it has been planted with trees meeting specified conditions.

Miri lazmah—land held under generally the same conditions as *miri tapu*, but with the stipulation that the government may veto the transfer of such land if it tends to disturb the peace, a precaution designed to prevent, where necessary, the transfer of tribal lands to people outside the tribe. *Lazmah* grants are made upon proof that a person has made productive use of the land within the preceding 15 years.

Miri sirf—land, particularly vacant or idle land, definitely acknowledged as belonging de facto and de jure to the state.

Although *tapu* and *lazmah* land are still recognized as *miri* or state land, they are in fact hardly distinguishable from full private ownership. In theory, possession of these lands may lapse if they are not productively used for three successive years in the case of *lazmah* and for four years in the case of *tapu*, but this apparently happens rarely, if at all. Prior to 1939 holders of such land were generally required to make to the state a payment for rent and water rights which was lower for *tapu* than for *lazmah* land, but in that year these assessments were abolished in return for amortization of their capitalized value over a period of 10 years. With the abolition of these payments there now remains very little distinction between *tapu* and *lazmah*.

The cadastral survey has now been completed for about half of the land in the 14 provinces in Iraq. The progress achieved is set forth in the table below. It will be noted that 61 percent of the total land surveyed and 51 percent of the cultivable land sur-

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TABLE 3

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LAND CLASSIFIED ACCORDING TO TYPES OF TENURE BY CADASTRAL SURVEY*
(in donums)

	Cultivable	Uncultivable	Total
Total area to be classified	—	—	107,045,725
Total area classified by Feb. 8, 1951	38,188,575	12,268,459	50,457,034
Mamlukah (mulk)	150,601	22,366	172,967
Matroukah	9,296	1,686,912	1,696,208
Mawqufa (waqf)	549,198	36,538	585,736
Miri tapu	8,370,595	698,987	9,069,582
Miri lazma	7,371,720	485,291	7,857,011
Miri sirf	21,737,165	9,338,365	31,075,530

* For fuller details, see Table I in the appendix.

veyed has been definitely adjudged to be *miri sirf*. Only a small part of the land is actually being exploited today. About 1.6 million donums is let by the state on triennial leaseholds which may be renewed once by the same holder. Virtually all of the land in Amara province is also leased out by the state. Here, however, it is held under virtually permanent leaseholds by sheikhs who have been rewarded by rather large tracts of land in return for maintaining order and performing other services in this province which has a somewhat unruly past.[2] The remainder of cultivable *miri sirf* land is in theory still available for exploitation. Presumably most of the better and more accessible lands have been alienated to private holders, and that remaining to the state is in large part relatively poor, inaccessible, or not susceptible of irrigation. Nevertheless, there is undoubtedly a large reservoir of state land which can still be opened to cultivation, particularly if irrigation is provided.

425 A feature of the 1932 law inaugurating the cadastral survey was the introduction of *lazmah* tenure. This type of tenure was designed to recognize prescriptive rights to tribal lands. In practice, the sheikhs rather than the tribesmen have benefited from this provision of the law. *Lazmah* grants could be obtained on proof

[2] In all there are 290 leaseholds of cultivated state land in Amara of which 13 are between 10,000 and 35,000 donums, 10 between 5,000 and 10,000 donums and 95 between 1,000 and 5,000 donums.

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that the land was cultivated and a crop produced in any one year, and the land settlement officers, who have sometimes been inexperienced and subject to influence, have on occasion accepted even more tenuous evidence as proof of a prescriptive claim. In this way a large portion of state land has been alienated to sheikhs and other influential persons, and the number of large landowners has multiplied.

Distribution of Land

Complete data on the distribution of landholdings are not available. For the area covered by the cadastral survey, it is possible to classify private landholdings into various categories according to size. Such a classification, given in the accompanying table, shows that holdings of 1000 donums or less account for only 15.7 percent of the area. This is indicative of the small number of peasant proprietors. On the other hand, holdings of over 1,000 donums accounted for 67.1 percent of the total of privately owned land, while those of more than 10,000 donums comprised 24.3 percent of the area. Moreover, the importance of large holdings is undoubtedly underestimated by these figures. The cadastral survey has proceeded by areas known as *muqata'as*. In a number of cases landowners have holdings in several *muqata'as*, but these have been registered as separate holdings. Thus, according to the cadastral survey, there is only one holding in Kut in excess of 100,000 donums (namely 174.251 donums), although it is generally reported that there are actually several holdings well over 300,000 donums.

The accompanying table indicates that the highest proportion of small holdings is apparently in Basra, Dulaim, Kirkuk and Suleimaniya. The provinces of Kut, Amara, Mosul, Diyala and Kerbela have the highest percentage of large holdings.

The Sharecropping System

Although the amount of land cultivated directly by the landowner has increased since the last war with the use of modern machinery, particularly in Mosul and Baghdad provinces, the great bulk of the land is tilled for the landholder by peasants or fellahin against a share in the crop. The sharecropper is not a tenant in the sense that this word is generally used in the western world. He has no discretion in the use of the land and does not lease a

TABLE 4

Distribution of Private Landholdings According to Cadastral Survey

(*mulk*, *tapu* and *lazmah* holdings)

Province	Percentage of Total Area by Cadastral Survey	Percentage of Area Covered by Cadastral Survey in Holdings of:									
		1-100 donums	101-500 donums	501-1000 donums	1001-10,000 donums	10,001-100,000 donums	100,001-200,000 donums	less than 501 donums	than less 1001 donums	over 1000 donums	over 10,000 donums
Mosul	64.2	17.1	4.1	2.8	48.8	27.2	—	21.2	24.0	76.0	27.2
Erbil	31.7	19.9	12.7	4.7	57.4	5.3	—	32.6	37.3	62.7	5.3
Kirkuk	44.4	32.4	13.9	5.0	29.8	18.9	—	46.3	51.3	48.7	18.9
Suleimaniya	14.3	24.7	18.1	8.9	42.4	5.9	—	42.8	51.7	48.3	5.9
Diyala	37.9	4.1	9.8	11.3	61.3	13.5	—	13.9	25.2	74.8	13.5
Dulaim	46.6	24.0	36.3	8.2	19.0	12.5	—	60.3	68.5	31.5	12.5
Baghdad	68.7	13.8	17.1	10.7	37.5	20.9	—	30.9	41.6	58.4	20.9
Kut	100.0	1.8	5.4	4.4	35.7	45.7	7.0	7.2	11.6	88.4	52.7
Hilla	94.7	18.4	13.7	9.4	41.0	17.5	—	32.1	41.5	58.5	17.5
Kerbela	42.5	15.7	7.6	1.6	43.8	31.3	—	23.3	24.9	75.1	31.3
Diwaniya	26.2	16.4	19.0	9.9	34.1	20.6	—	35.4	45.3	54.7	20.6
Basra	20.6	25.5	16.5	6.8	43.9	7.3	—	42.0	48.8	51.2	7.3
Amara	37.7	2.9	2.7	5.0	13.6	75.8	—	5.6	10.6	89.4	75.8
Total	50.0	15.7	11.0	6.2	42.8	23.2	1.1	26.7	32.9	67.1	24.3

7: International Bank N, S-4 (1951) 1952 MH1 Iraq MH1

specified piece of land for a definite period from the landholder against a fixed rental. The landholder or his agent *(sirkal)* assigns to the sharecropper each year the land to be cropped, determines the type and quantity of seed to be sown and prescribes the time and methods of plowing, watering, harvesting, etc. He generally makes an initial advance to the cultivator and often provides the fellah with seeds, draft animals and other means of production. Under the Law Governing the Rights and Duties of Cultivators enacted in 1933, the landholder has the power to keep the fellah on the land as long as the latter is indebted to him. Thus the fellah is in reality a laborer who works with his family not for a fixed wage, but for a share of the crop.

The portion of the crop retained by the fellah varies rather widely. In the northern rain-fed zone it is higher than in the southern irrigation zone. In flow-irrigated areas it is half or two fifths but drops to about one third when the landholder provides the seed. Although, under the law, the landholder is not allowed to charge interest on his advances to cultivators, his share of the crop when he provides the seed increases out of proportion to the cost of the seed he furnishes. When the land is pump-irrigated, the fellah's share is generally only two sevenths or three sevenths of the crop. In date and fruit groves where the landowner must make a heavy investment and the value of the output is high, the fellah may only get a fifth to an eighth of the crop. In the rain-fed zone the fellah usually retains 90 percent of the winter crop and even more if the land is relatively remote from the town or city. His share of summer crops which can only be grown with water furnished by the landowner may range from two thirds to one half provided he supplies his own seeds and implements. In general the fellah's share is larger in the North because manpower is less plentiful in relation to available land, yields tend to be lower owing to uncertain rainfall and the fellah frequently has long-established rights to the cultivation of his land.

The amount of land cultivated by each fellah and his family varies widely. In the irrigation zone the fellah may on the average plant about 20 donums of winter crops, and, owing to the shortage of water, perhaps 15 percent of this area in summer crops. In rice areas, he generally has only about four to five donums on the

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427 241 average; and in date and fruit groves his allotment is likely to be equally small. In each of these cases, however, the output per donum is considerably more valuable. In the rain-fed plains of the North where land is more plentiful and yields more uncertain, he may on the average plant as much as 40 donums in winter crops. In most areas the fellah and his family can probably get as large a winter crop area as they can till, but their capacity is limited by lack of draft animals, primitive agricultural techniques and the debilitating effects of disease and a hot climate. In some areas of the irrigation zone, however, particularly in parts of Hilla, Kerbela and Diwaniya, the fellah appears to get less land than he can till owing to the limited availability of good, irrigated land. The same applies to some rice-growing areas, particularly in Amara.

Lack of sufficient draft animals and implements, low yields and the necessity of turning over a share of the crop to the landlord or pump owner all combine to depress the economic status of the sharecropper. His position can only be improved by enabling him to raise his output or by increasing his bargaining power through the creation of alternative opportunities for employment and the opening up of new lands to settlement.

Minerals: Oil

135 315 Iraq possesses considerable mineral resources. Of these by far the most important is petroleum. There are at present two major oil fields—one near Kirkuk in the North, the other near Basra in the South. The Kirkuk field is generally reputed to have reserves of over 1,000 million tons, while that near Basra, which is less well explored, seems to be almost equally promising. There are also minor oil fields at Ain Zaleh in Mosul province and near Khanaqin on the Iranian border.

135 Although surface indications of the existence of copper, iron, chromite and other ores have been found in the mountainous belt adjoining Turkey and Iran, the existence of deposits of sufficient size to warrant commercial exploitation must first be confirmed by core drilling.

7: International Bank N, S-4 (1951) 1952 MH1 Iraq MH1

V. Production

A considerable part of Iraq's potentially large resources are as yet unutilized or ineffectively utilized. Most of the manpower on the land is underemployed for a large part of the year, and considerable unemployment exists in the major cities. Vast tracts of land await reclamation and irrigation before they can be used. Much of the available water is wasted owing to lack of storage and regulation of flow. Oil reserves have as yet been tapped only in relatively modest quantities. The output of the country is therefore still very low and the standard of living correspondingly depressed.

Agriculture and Livestock

Estimates of the area and output of the principal crops are given in the table below. Although the statistics are not very reliable, they give some indication of the relative importance of the various crops. Barley and wheat are clearly the dominant crops. Barley is one of the leading exports, and cereals altogether accounted for 43 percent by value of the country's exports other than oil in the period 1948-50. Rice is another important cereal. Cotton is now vying with rice as the leading summer crop. Stimulated by high prices and government encouragement, the area planted to cotton has risen rapidly in recent years. In 1951, probably about 580,000 donums were put in cotton—almost five times the amount in the preceding year. Other summer crops are comparatively insignificant. Some sesame is grown for oil, and some corn, millet and grain sorghum. Tobacco assumes importance only in the mountainous area of the North. Virtually no crops are grown for animal fodder, and the production of hay is unknown. The area devoted to soil-building crops such as legumes is rather small.

Next to cereals, dates are the most important crop. There are about 20.2 million date trees, of which about 9.7 million are along the Shatt al Arab near Basra and the balance in the central valley districts of the Tigris and the Euphrates and the Diyala River Valley. Dates are a staple food over most of Iraq and date exports, particularly from the Basra area, contributed 31 percent by

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TABLE 5

Estimated Area and Production of Principal Crops

	Area (in 1000 donums)				Production (in 1000 metric tons)			
	1935-39 Average	1946-50 Average	1949	1950	1935-39 Average	1946-50 Average	1949	1950
Winter crops								
Barley	3200	4156	3814	4000	583	703	750	800
Wheat	2940	3686	3493	3800	541	375	450	520
Lentils	n.a.[1]	41	43	45	n.a.	5	5	6
Vetch	n.a.	28	34	35	n.a.	2	3	3
Linseed	n.a.	6	6	8	n.a.	0.2	0.3	0.2
Summer crops								
Rice	636	970	617	870	148	273	212	242
Cotton	84	55	43	130	2.5	7	6	25
Sesame	n.a.	153	176	75	n.a.	10	9	10
Vegetables	n.a.	n.a.	100	110	n.a.	n.a.	n.a.	n.a.
Corn	n.a.	106	61	130	150	16	10	21
Millet	n.a.	160	165	140	n.a.	13	18	19
Green gram	n.a.	86	111	70	n.a.	9	11	12
Tobacco	16	19[2]	15[2]	16[2]	5	4[3]	5[3]	3[3]
Dates	n.a.	750	750	750	300	275	170	250
Other fruits					n.a.	n.a.	n.a.	n.a.
Vegetables	n.a.	n.a.	100	110	n.a.	n.a.	n.a.	n.a.

[1] Not available
[2] Licensed area
[3] Purchases by the Tobacco Monopoly

7: International Bank N, S-4 (1951) 1952 MH1 Iraq MH1

value of the country's total exports, other than oil, in the years 1948-1950. Citrus fruit, grown for domestic consumption, is of considerable importance in the Diyala River valley and substantial quantities of other fruits and nuts, although of rather poor quality and marketability, are grown in the North, especially in Sulei-maniya and Erbil. Vegetable culture is of particular importance in the neighborhood of large cities.

Agricultural yields are generally low, although most of the soil is inherently quite fertile. Barley yields, for instance, are about 30 to 35 percent less than those in Canada and the United States and probably slightly less than those of Turkey and Iran. Little or no animal manure or fertilizer is applied, animal dung being used largely for fuel. Salinity attributable to poor drainage has materially lowered productivity of land in the irrigation zone. The soil is often poorly prepared, and weeds detract from the yields. Chief reliance is placed on the fallow system to restore soil fertility, but, since fallow land is often allowed to go up in weeds on which animals graze, its efficacy is limited.

The raising of livestock is an important industry. Sheep and goats predominate because they thrive despite poor grazing and feeding.

TABLE 6

ESTIMATE OF LIVESTOCK POPULATION, 1949-50

Sheep	7,489,700
Goats	1,754,300
Cattle	1,034,600
Buffaloes	200,700
Camels	279,200
Horses	183,800
Mules	66,850
Donkeys	326,400

Sheep and goats, as well as camels, are kept primarily by pastoral nomads who probably number well over 200,000. Cattle and water buffaloes are the livestock of the settled agricultural

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231 population. Livestock, however, are an adjunct to agriculture rather than an integral part of it. Many fellahin have no livestock at all except for a draft animal or two. Livestock are left to forage for themselves, with only some supplementary feeding with straw and perhaps barley in the winter. Only the livestock in and around the cities are systematically fed. Livestock yields are generally very low, primarily because of inadequate feeding, but also because [439] of poor breeding and disease. Yet livestock and livestock products —wool, hides and skins, and casings—accounted for about 13 percent of the total value of Iraq's exports, exclusive of oil, in the period 1948-1950.

Industrial Output

433 Industrial production is still very small. Reliable figures on industrial output and employment are unavailable. According to the Department of Labor, there are roughly 2,400 enterprises in industry, exclusive of service industries, employing over four persons. From Department of Labor data as well as certain supplementary sources, it is possible to give a breakdown for approximately 45,000 people engaged in industrial production. As already indicated, the actual number of people so employed is apparently considerably greater if account is taken of small handicraft enterprises. About 11,500 are employed in petroleum production and refining. The textile, apparel and footwear industries probably employ about 11,000 people. The processing of food, beverages, tobacco, other agricultural products and livestock products accounts for an employment of perhaps 9,000; the production of building materials, including bricks, tile and cement, for about 6,000; and wood processing, for approximately 2,000. Metal-working and machinery repair and maintenance account for most of the balance.

These employment figures tend to convey a rather exaggerated impression of possible industrial output. With the exception of those in the petroleum industry, virtually all are employed in small undertakings where the work is predominantly done by hand and productivity is accordingly very low. It is estimated that only about 2,000 people are engaged in what might be characterized as modern plants. Among these are one woolen and one cotton mill, one brewery, several distilleries, a cement plant, a vegetable oil and soap factory, and a number of flour mills.

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TABLE 7

ESTIMATED INDUSTRIAL EMPLOYMENT

Petroleum production and refining	11,500
Food and beverage	4,500
Tobacco	3,500
Wool and cotton processing, textiles, wearing apparel and footwear	11,000
Wood processing and wood products	2,000
Leather (other than footwear)	450
Chemicals (vegetable oils, soap, etc.)	550
Building materials	6,000
Metal-working, including jewelry	1,500
Machinery and machinery repair	2,700
Electricity and water supply	1,100
Miscellaneous	1,000
Total	45,800

Indications of output in the more primitive industries are very scanty, but data on output in some of the more modern industries can be found in the monograph on Industry. Production is, in general, on a modest scale, although some industries such as cement fill most of the country's needs.

Petroleum Production and Refining

Although production of petroleum is now rising rapidly, it has been relatively modest in the past. The exploitation of oil is predominantly in the hands of three companies—the Iraq Petroleum Company, the Mosul Petroleum Company and the Basra Petroleum Company—all owned in equal shares, except for five percent controlled by Mr. Gulbenkian, by the Anglo-Iranian Oil Company, the Royal Dutch-Shell, the *Compagnie Française des Petroles* and the Near East Development Corporation (owned jointly by Standard Oil of New Jersey and Socony-Vacuum). Of these three, the Iraq Petroleum Company, which is exploiting the large field near Kirkuk, is the only one in production. In addition, the Khanaqin Oil Company, a subsidiary of the Anglo-Iranian Oil Company, has a small concession adjoining the Iranian border.

Efforts to develop production have been concentrated mainly on the Kirkuk field where oil is found at the depth of only between

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315 2,500 and 2,800 feet and production costs are accordingly low. Production capacity has been increasing more rapidly than transport capacity. Until 1949 there were only two 12" pipelines with an annual capacity of over 2,000,000 tons each—one to Tripoli in the Lebanon, the other to Haifa in Palestine. With the outbreak of war with Israel the Haifa pipeline was shut down and work on the completion of an additional 16" pipeline to Haifa, which was to have an annual capacity of 4,000,000 tons, was halted. Output therefore had to be reduced from 4,354,000 tons in 1947 to 3,017,000 tons in 1948. With the completion of another 16" line to Tripoli in 1949, it rose again to about 6,000,000 tons in 1950. Work has proceeded steadily on the construction of a new 30" line, with an annual capacity of 13,000,000 tons, from Banias, Syria, and it is expected that this line will be linked in the spring of 1952 with the disused portions of the two lines to Haifa lying inside Iraq, thus permitting a partial use of the new capacity while the remainder of the line is finished in Iraq. Meanwhile the productive capacity of the Kirkuk field is being increased rapidly to an annual volume of over 20,000,000 tons.

In Mosul, where prospects are much less promising, production is not expected to begin until 1953 and then only at a rate of about 1,000,000 tons per year. Work on the fields near Basra, which are potentially very rich, was begun much later but is now rapidly proceeding. Production costs will be considerably higher than at Kirkuk because oil is found only at a depth of 10,000 feet or more. A pipeline with an annual capacity of about 2,500,000 tons has been completed to the port of Fao on the Persian Gulf, and oil is expected to start flowing early in 1952. The company has undertaken to increase production to 8,000,000 tons by 1955.

382 The output of the Khanaqin Oil Company is confined to two wells in the Naft Khaneh field and is used entirely in the company's Alwand refinery, a simple distillation plant which is the only refinery in Iraq. Although drilling is proceeding in the Chia Surkh field north of Khanaqin, it is unlikely that the company's total output will rise substantially. The company's Alwand refinery, which employs approximately 525 people, produces about 70 percent of the petroleum products consumed in Iraq, the remainder being supplied, until recently, from the Abadan refinery in Iran.

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Petroleum products are distributed by the Rafidain Oil Company, a subsidiary of the Anglo-Iranian Oil Company, and at prices, exclusive of taxes, which are among the lowest in the world.

TABLE 8

PRODUCTION OF PETROLEUM AND REFINED PRODUCTS
(in thousand metric tons)

	1947	1948	1949	1950	1951 (est'd.)
Crude oil					
Iraq Petroleum Company	4,354	3,017	3,671	5,986	7,500
Khanaqin Oil Company	339	367	365	384	350
Total	4,639	3,384	4,036	6,370	7,850
Refined products	n.a.	373	369	393	—

VI. Transport

The state-owned railway system is the principal means of transport, carrying about 2,000,000 tons of cargo and over 3,000,000 passengers annually. Part of it is standard and part meter gauge. The standard-gauge section is part of the original Berlin-Baghdad railway and runs from Baghdad northward via Mosul into Syria and Turkey. The meter-gauge line extends from the Port of Basra in the South to Baghdad and then beyond to Kirkuk and Erbil in the North, with a branch line to Khanaqin. Over recent years the railways have managed to carry out a considerable capital development program despite serious financial obstacles, but they now face the need of replacing, on a considerable scale, old track, rolling stock and locomotives.

Road transport has as yet primarily supplemented rather than replaced railway traffic. There are only about 11,000 passenger cars and a little over 9,000 trucks and buses in the country. Roads are generally inadequate. There are only about 2,500 kilometers of metalled and surfaced roads in all of Iraq. The remaining dirt roads quickly become impassable in bad weather. Some important

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491 494 centers such as Amara and Kut are linked neither by rail nor by all-weather roads to Basra and Baghdad.

504 497 In Basra, Iraq possesses an excellent port capable of handling a considerable increase in traffic. Upcountry cargo into and out of the port is handled almost wholly by railway, for inland river traffic has declined greatly in importance owing to shallow water and other impediments to navigation.

The port and the railways are each run by an autonomous administration operating under a separate budget.

VII. Money and Banking

453

The banking system consists of the National Bank, five commercial banks, a number of private banks or *sarrafs*, the post office savings bank, and three state-owned longer-term financing institutions, the Industrial Bank, the Agricultural Bank and the Mortgage Bank.

652 453 The National Bank succeeded the Iraq Currency Board as the currency-issuing authority in 1949. Iraq is a member of the sterling area, so that its currency is backed principally by sterling assets in London. Although the law permits the currency to be backed up to 30 percent by Iraqi government securities, as of March 31, 1951, the total amount of currency in circulation was more than covered by sterling assets. Aside from its note-issuing function, the Bank is charged with the administration of foreign exchange control and the supervision of the banking system in accordance with a bank control law which became effective at the beginning of 1950. This law requires banks to keep the equivalent of 15 percent of their time and demand deposits as a reserve with the National Bank and to keep 50 percent of these deposits in the form of cash and investments in Iraq. The National Bank is empowered to reduce the reserve requirement to 10 percent and to vary the second between 30 and 70 percent. Since the commercial banks have had no need for recourse to the National Bank in order to replenish their cash resources, the Bank's loans and advances have remained very small. As of March 31, 1951, they

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stood at only ID 650,000, consisting almost wholly of advances to the Baghdad Water Board and the Industrial, Agricultural and Mortgage Banks. Almost all of the remaining assets of the Banking Department consist of Iraqi government securities valued at ID 5,490,000.[3]

There are five commercial banks in Iraq, of which three are foreign banks. Of the two Iraqi banks, one, the Rafidain Bank, was organized and is controlled by the government and serves as the depository of government funds. These banks confine themselves principally to the short-term financing of foreign and domestic trade and have always kept themselves very liquid. Thus, as of March 31, 1951, their total liquid assets, including notes and coin, current accounts abroad, discounts and davances, but excluding the statutory 15 percent reserve maintained with the National Bank, amounted to about 87 percent of their current and short-term liabilities, and even 70 percent when advances which are primarily short-term are kept out of account.[4] The operations of the commercial banks are supplemented by the *sarrafs* which are principally engaged in financing small traders. Their number has been drastically reduced in the last year or two, owing partly to the exodus of the Jews and partly to their failure to meet the requirements of the bank control law that they submit their accounts and divorce their banking and trading operations.

The total foreign exchange assets of the banking system are quite considerable. As of March 31, 1951, they amounted to about ID 50,400,000. Total holdings tend to fluctuate primarily because of the influence of harvests upon exports. Thus a harvest failure in 1947, followed by another bad harvest in 1948, as well as the effect of the outbreak of war with Israel in 1948, were instrumental in reducing holdings from ID 64,900,000 at the end of 1946 to ID 43,400,000 in September 1949. As the result of two successive good harvests, reserves then rose in the ensuing year and a half by ID 7,100,000.

Part of Iraq's sterling assets have been frozen since the war, releases being governed by a five-year agreement effec-

[3] See statement of the National Bank's assets and liabilities in Table II in Appendix.

[4] For a consolidated statement of the principal assets and liabilities of the commercial banks, see Table III in Appendix.

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457 tive from July 15, 1947. In a supplementary agreement con-
453 cluded in February 1951 the National Bank obtained an additional release of £2,000,000 and a guaranty of further releases up to £6,000,000 over the next two years, whenever necessary to maintain its free sterling working balances at a level of £6,000,000. As of March 31, 1951, the banking system still held £29,400,000 in blocked sterling out of total sterling assets of £49,700,000. Since Iraq's foreign exchange assets consist almost entirely of sterling, Iraq must apply to the British government for hard currency releases from the sterling area pool to meet dollar payments. Until February 1951 such releases were limited to specific periodic sums, but a new agreement for one year concluded at that time provided that sufficient releases would be made at all times to cover Iraq's essential requirements. There was no specific provision referring to the large requirements arising out of increasing investment outlays.

454 While short-term financing has not been a problem, the financing of the longer-term capital requirements of industry and agriculture has always been difficult. The amount of savings channeled into the banking system has always been small. Savings accounts in the commercial banks have varied between ID 1,700,000 and ID 2,400,000 over the last two years, and the total savings deposits with the postal system have been less than ID 900,000. Considerably more is undoubtedly saved, but much of it takes the form of hoarding. Thus it is generally assumed in Iraq that virtually all of the 100-dinar notes and a considerable part of the 10-dinar notes in circulation (ID 9,000,000 and ID 9,500,000 respectively as of March 31, 1951) are hoarded. There is a general preference for the investment of capital in urban and rural property, which are regarded as affording a high degree of security, and in commerce which yields a high return. Industry and agriculture have generally been starved of capital, although investments in these fields are slowly becoming more acceptable.

453 As a partial remedy for this shortage of capital, the government has established three institutions to finance industry, agriculture and building. Although each of these is capitalized at ID 1,000,000, the government has actually furnished only ID 550,000 to the Agricultural Bank, ID 600,000 to the Industrial Bank and ID 100,000 to the Mortgage Bank. While each bank has tried

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to supplement its capital by borrowing and accepting time deposits from certain institutions, their resources have been wholly inadequate to the need.

VIII. Domestic and Foreign Trade and the Balance of Payments

As noted earlier, trade is probably the second most important occupation. To all appearances, the system of distribution is extremely wasteful. Both in the small towns and in the larger cities there are numerous traders with very small stocks of goods, who cannot possibly earn more than an exiguous income, even if their margin of profit is high. The position is, however, not likely to be cured until the general level of incomes rises and there is alternative opportunity for employment.

Iraq produces most of its food, but apart from fuel, tobacco, and some building materials, most of its other requirements must be imported. Even the small local industries and handicrafts depend to some extent on imported raw materials. Much of the trade is therefore foreign trade. Baghdad is the principal center for the import trade and also has a considerable share in the export trade, although Mosul is the main center for the export of wool and Basra for dates and barley.

Although there are a number of large firms, among them several foreign companies, engaged in the export-import business, trade is by no means monopolized, as can be seen from the following table which shows the distribution of import licenses granted:

TABLE 9

IMPORT LICENSES: 1951

Import Quota (ID 000)	Number of Importers		Total Allocation (ID million)
	Baghdad	Other Cities	
100-180	36	18	6.6
50-80	60	24	4.9
20-40	344	147	13.1
5-10	1,015	502	10.4
	1,453	691	34.9

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439 477 [453] Competition, in fact, is quite keen in bulk commodities like sugar, tea and textiles. There is no organized market, either in export or import commodities, so that, as speculation is rife, prices can swing rapidly upward on the basis of rumored or actual shortage.

TABLE 10

439 IMPORTS INTO IRAQ (by value)
(in millions of dinars)

	1938	1947	1948	1949	1950
1. Sugar	0.5	1.7	3.7	2.2	4.8
2. Tea	0.4	2.3	2.1	2.8	2.9
3. Cereals and flour	—	0.2	2.3	1.1	—
4. Other food, beverages and tobacco	0.4	2.0	1.4	1.5	0.9
5. Cotton and rayon piece-goods	1.3	7.7	7.7	6.2	6.4
6. Other textiles and clothing[1]	0.9	4.0	3.4	2.9	3.0
7. Soap and matches	0.1	0.8	1.0	1.0	0.7
8. Cement and timber	0.5	1.6	1.6	1.0	0.4
9. Petroleum products	0.3	0.9	1.6	1.3	1.6
10. Iron and steel	1.1	4.8	5.0	4.9	3.7
11. Automobiles, trucks, and parts[2]	0.5	2.3	2.5	2.7	2.2
12. Machinery; electrical and other transport equipment	1.7	4.4	6.8	7.0	5.9
13. Miscellaneous	1.7	7.3	6.4	5.9	5.2
Total	9.4	40.0	45.5	40.5	37.6
Oil company imports[3]	1.0	5.1	9.5	10.3	8.4
Net	8.4	34.9	36.0	30.2	29.2

[1] Excluding burlap bags, rope, etc.

[2] Including tires and tubes.

[3] The majority of these imports were in categories 9 to 12. For example, oil company imports in these categories were about ID 8,000,000 in 1948 and ID 9,000,000 in 1949, out of a total of ID 16,000,000 in each year. Except for petroleum products, these goods were virtually all for the companies' own use rather than for resale.

Imports

Table 10 gives a list of the principal imports for 1938 and for the last four years. Broadly speaking, categories 1 to 7 represent the principal consumer goods, categories 8 to 12 fuel, building materials and capital equipment, and category 13 some consumer goods and some industrial raw materials. As the footnote to

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the table indicates, however, the list as it stands includes imports 439
by the oil companies for their own use, only a very small proportion of which are consumer goods. If these are eliminated, the breakdown in 1948 and 1949 would be roughly as follows:

TABLE 11

IMPORTS
(excluding oil company imports for their own use)

		1948 (ID million)	1948 (%)	1949 (ID million)	1949 (%)
1-7.	Principal consumer goods.....	21.5	59	17.6	56
8-12.	Fuel, capital goods, etc.	11.0	30	9.3	29
13.	Miscellaneous	5.0	13	4.6	15
		37.5	100	31.5	100

Thus about 60 percent of the imports other than those by the oil companies were consumer goods, of which textiles, sugar and tea, which are the bulk commodities purchased by the mass of the people, were much the most important. Quantities of these goods imported during the past years are shown in the following table:

TABLE 12

IMPORTS OF TEXTILES, SUGAR AND TEA
(by quantity)

	Piece-goods			Sugar	Tea
	Cotton	Art. silk	Woolen	(000 tons)	
	(in million square meters)				
1930-34 av.	62.2	11.4	1.2	37.6	2.1
1935-39 av.	60.6	17.3	2.2	40.5	3.0
1947	47.2	4.1	1.2	28.7	6.4
1948	56.0	1.5	2.0	85.8	6.2
1949	61.6	4.2	1.6	52.0	8.0
1950	54.3	10.1	1.4	87.2	6.9

It will be observed that imports of sugar and tea are now more than double what they were before the war, which, even after discounting an increase in population, must indicate a large rise in consumption per head. Imports of textiles, on the other hand, are

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439 actually less than before the war, so that, although domestic production has increased, consumption per head must have fallen. Since the war, however, the government has encouraged the import of secondhand clothing, licenses being granted for imports from the United States.

433 439 Iraq usually produces sufficient cereals for its own use, imports in 1948 and 1949 being the consequence of two successive harvest failures. Apart from ghee, spices and some vegetables, most of the other foods are high-quality products consumed by the comparatively rich. Of these the import of beer has recently been prohibited, since a modern brewery now supplies the country's requirements.

Both soap and matches are made in Iraq, but soap manufacture was until recently a "backyard" industry and the quality of the product was poor. The sharp drop in imports of cement and timber in 1950 is a consequence of the new cement plant coming into full production. Imports of timber were also low owing to a depression in the building industry. Timber requirements are, however, likely to increase, as Iraq's own sources of supply are meager. Imports of iron and steel have also been affected by the slump in construction. This category, however, includes a wide range of other articles besides structural steel, the most important in recent years being pipelines for the oil companies. Other articles, such as household ware, should more properly be included with consumer goods.

As Iraq's output of refined petroleum products is limited to a small refinery and the requirements of motor transport, irrigation pumps, agricultural machinery and industry have steadily increased, a growing deficit has had to be made up by imports. The government plans to build a new refinery which should, when completed, remove the need to import virtually all of these products.

Among the most important categories of machinery are irrigation pumps and agricultural machinery, imports of the latter having greatly increased since the war. Other items include equipment for electricity production and distribution, and plants for the various new industries started since the war, such as textiles, distilling and the manufacture of ice.

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The miscellaneous category includes such items as glassware, ceramic products and pharmaceutical products. A number of raw materials or other products used in industry are also included, for example: tanning material; leather for shoemaking; wooden boxes and other materials for packing dates (to the value of about half a million dinars in 1948); oils and oilseeds for the vegetable oil and soap industry; and non-ferrous metals for the small metal-working industries.

Exports

The three principal groups of exports are dates, cereals and animal products. Although there have been large fluctuations in the quantities exported, particularly of cereals, over the last 25 years their combined value has usually been at least 85 percent of the total value of exports other than oil, and has often been more. Of the remaining export products, cotton has usually been of some importance in the past and promises to be of much greater importance in the future. Prewar and postwar values of the groups of exports are shown in the following table:

TABLE 13

PRINCIPAL EXPORTS
(in millions of dinars)

	1931-35 Av.	1936-39 Av.	1947	1948	1949	1950
Dates	0.9	0.9	4.7	4.7	3.2	4.3
Cereals	0.7	1.3	6.7	0.2	5.8	10.8
Animal products	0.5	1.2	1.2	1.6	1.2	2.2
Other	0.4	0.5	1.2	1.1	1.0	3.1
Total	2.5	3.9	13.8	7.6	11.2	20.4

Dates. Iraq has long been the foremost exporter of dates in the world. The quantity exported has increased steadily from an average of 120,000 tons in the late twenties to 200,000 tons since the war. The crop may vary considerably from year to year. For example, the amount exported in the last quarter of 1949 and the first three quarters of 1950, which represents approximately the exportable surplus from the 1949-50 crop, was about 150,000 tons. The 1950-51 crop, on the other hand, was unprecedentedly large and a record amount of 340,000 tons was exported.

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439 433 As Iraq has such a large share in the world's trade, variations in the size of the crop can cause large fluctuations in price and, in a prolific year, marketing difficulties. Since 1939 the burden of marketing the prime quality varieties (Khadrawi, Hallawi and Sayer), which are sold in the United Kingdom, Western Europe, North America and Australia, has been largely removed by a series of bulk contracts between the Date Association and a British company, under which the latter has agreed to purchase at a fixed price all dates of these varieties grown in Basra province.

No such scheme exists for the Zahdi and other lower quality dates. Their principal markets are in India, Egypt and other countries of the Far and Middle East to which much of the trade is carried in the traditional Persian Gulf sailing ships. Disposal of the extremely large 1950-51 crop through the normal channels proved impossible and the price of Zahdi dates fell during 1951 to a point where it was hardly remunerative to transport them to Basra. Faced with this situation, the government sent a trade mission to India and Pakistan and succeeded in making agreements with those countries which provided, among other things, for increased imports of dates.

Cereals. Barley is the only cereal now exported in large quantities, but the quantity is subject to extreme fluctuations owing to the great variability in the crop. On the average, exports have increased considerably over the years. In the latter half of the twenties, they averaged 100,000 tons and before the war 230,000 tons. From 1945 to 1947 they were around 250,000 tons annually, but successive bad harvests in 1947 and 1948 led to a temporary ban on exports in 1948, when less than 5,000 tons were exported. Two bumper crops followed, however, and in 1949 and 1950 exports, which had not before exceeded 300,000 tons, amounted to 326,000 and 462,000 tons respectively.

433 439 262 There was normally a surplus of wheat for export before the war; in 1937, the best year, over 100,000 tons were exported. Since the war, however, exports have been negligible except in 1950, while in 1948 and 1949 there were considerable imports as a consequence of the bad harvests. On balance, therefore, Iraq cannot at present be considered an exporter of wheat. This is, no doubt, due to the increasing consumption of wheat in the country, as a

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consequence not only of the increase in population, but also of the shift from the rural areas, where barley is often a staple element in the diet. 438 439 262

Large quantities of rice are produced, but the surplus for export has always been very small. The only other cereal exported in any quantity is millet.

Animal Produce. The principal animal products exported by Iraq are wool, live animals, hides and skins and casings (intestines), usually in that order of importance. The sheep is the main source of these products, providing all the wool and usually the bulk of the other products. As with dates and cereals, the quantities exported vary greatly from year to year, sheep being vulnerable not only to disease, but also to extremes of winter cold and summer drought. In contrast with the other main exports, however, there has been no tendency for exports of animal products to increase. Exports of wool, hides and skins have, on the whole, been below prewar levels, while those of casings have fallen off badly. As animals are often taken across the frontier on the hoof, customs returns of live animals exported are not reliable. The recorded decrease since before the war, is, however, too large to be discounted. 433 439

Information on the animal population and on the domestic consumption of meat and other products is sketchy and unreliable. A rise in the consumption of meat could well explain the loss of exports of live animals, but this in turn would tend to make available a larger, not smaller, supply of most by-products. Part of the explanation of the fall in export products may lie in a declining sheep population owing to the gradual shift from the pastoral life to settled agriculture and from agriculture to the towns. The monograph on agriculture and animal husbandry discusses the shortcomings of the livestock industry and recommends measures to improve livestock raising and the quality of livestock products. The value of exports of animal products is likely to continue its downward trend unless these measures are undertaken speedily and vigorously. [233 162]

Sheep are especially important as a potential source of dollars. Wool is the most important export to the United States, which also takes all the casings exported and considerable quantities of 439 457

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439 457 skins. Not all the dollar income accrues to Iraq, however, partly because invoices are regularly undervalued and also because some commodities are sold through intermediaries in the Lebanon.

439 **Other Products.** In the years 1947 to 1949 the remaining exports consisted of the following: bricks and sand exported for use by the Anglo-Iranian Oil Company to the value of about ID 300,000 a year; a variety of agricultural products, whose total value did not exceed ID 500,000 in any one year; and cotton. Iraq has always exported a little cotton, but in the best years, just before the war and again in 1950, its value was only about five percent [248] of all export receipts. The position is now changing radically. Iraq, like several neighboring countries, is experiencing a cotton boom. Under the stimulus of high prices, the area under cultivation has increased rapidly in the last few years and predictions for the 1951 crop have ranged as high as 150,000 tons of seed-cotton, compared with 25,000 tons the year before. If the fellah's traditional aversion to a crop he cannot consume himself has been permanently overcome and if he can acquire the necessary knowledge for good cultivation, cotton could very soon become one of Iraq's most important exports, if not the most important. As a summer crop, however, its cultivation will be hazardous until the control of the rivers gives better assurance of a summer water supply.

Import Policy

439 656 457 All foreign transactions are, with certain exceptions, subject to exchange control. Imports from hard currency areas have been governed by licensing systems and have been limited to goods such as agricultural and industrial machinery, automobiles, trucks and drugs. Before 1948, imports from other areas were not subject to license, except for about 100 items, mainly luxuries. In that year, however, Iraq experienced a very large drain on her foreign exchange reserves and a more complex system was introduced.

Under the system now in force, all imported goods have been placed on one of several lists, the two longest consisting of "unlimited" and "limited" goods. Each merchant is given an annual quota in dinars, within which he can import unlimited goods without restriction, provided he obtains a license for each purchase. Alternatively, he can spend a small part of his quota on "limited" goods, but only up to a fixed amount.

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Unlimited goods consist mainly of the goods purchased by the common people such as tea, sugar and cotton textiles, and a variety of other goods considered essential, such as drugs and medical equipment, educational matter, industrial, electrical and agricultural machinery, transport equipment and raw materials for local industries such as gunny bags, certain vegetable oils, *mastika* (for *arak*), tanning extracts and non-ferrous metals. The principal object of the system, when it was introduced, was to prevent a shortage of these necessities—and hence high prices—at a time when imports as a whole had to be restricted to protect the country's exchange reserves. As an additional safeguard, each application for an import license was scrutinized to insure that the articles being purchased were not too highly priced. Since Iraq's foreign exchange position greatly improved in 1950, the import of unlimited goods is now permitted without any quota limitation.

The goods on the limited list, while not strictly luxuries, consist of goods considered less essential than those in the unlimited list. This includes, for example, ready-made clothing of various kinds, automobiles, matches, and certain types of household utensils and electric ware. Luxuries, such as bananas, confectionery, cosmetics, Persian rugs and nylon stockings, were placed on a third list of goods "without foreign exchange." These goods could be purchased only by merchants who held a special license to import "without foreign exchange," which meant that they had to acquire foreign exchange through other than the official channels. Such licenses also permitted them to purchase goods on the other two lists.

Foreign exchange can be acquired without official license in a number of ways, of which the following are probably the most important: by undervaluation of exports, especially wool, hides and skins; by the export of dates to neighboring countries in small craft (in this case retention of foreign exchange is legally permitted); by smuggling, although there is probably a net inflow of smuggled goods; by sale of dinar notes to foreign pilgrims to the Holy Cities; and by overvaluation of imports. The present system was introduced in order to compel merchants to use these resources instead of drawing on the national exchange reserves. Although the system has been successful in that there has been a very

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439 656 457 extensive use of private exchange holdings, particularly in 1949 when licenses to the value of over ID 10,000,000 were issued, it may well be that it has also encouraged the illegal acquisition of foreign exchange.

A fourth list consists of prohibited goods. This is purely a protective device, almost all of the goods in this list being produced in Iraq. These include a variety of agricultural products such as sesame seeds and cottonseed or their oils. Several of the newer industries have also been protected by the prohibition of their products, for example, beer, cement, cotton yarn, aluminum ware, alcohol and hides.

Although the improvement in the foreign exchange situation has led to a relaxation of the quota limitation, the other restrictions remain. In particular, import licenses still have to be obtained for each purchase. Although it is maintained that licenses can now be obtained quickly, this appears to act as at least a psychological deterrent to merchants. One of the objects of the licensing system is to restrict importing to bona fide merchants, but if this is considered necessary, it could, of course, be achieved by the issue of a general importer's license, good for a period such as a year.

439 656 As the economy develops and the standard of living rises, which it may do rapidly in the near future, the demand for goods now on the limited and prohibited lists is likely to increase and restrictions on imports of these goods might easily have an inflationary effect on prices. This would hit the artisan, the clerk and the civil servant, and might increase the cost of the development program. Any extension of prohibition to textiles and other goods produced in Iraq would, of course, hurt the poorest classes. Under these circumstances, it will be very difficult to manage so rigid a system.

A much more flexible instrument would be the customs tariff, but little coordination of the import licensing system with the tariff [651] seems to have been achieved. At present the tariff is primarily a means for raising revenue and, as such, imposes the greatest burden on those who buy bulk commodities. It hardly conforms to the objectives of a licensing system that aims at a plentiful supply of these goods at low prices. The principal objection put forward to higher duties on luxuries is the increased premium

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thereby put on smuggling which is difficult to control in a country with long land frontiers, even with a large police force. On the other hand, smuggled goods can now be purchased quite openly, and it is hard to believe that enforcement could not be made more effective.

In any event, outright restriction of imports could cause prices to rise and so put almost as great a premium on smuggling as a high tariff. The government has tried to prevent excessive mark-ups on certain goods such as radios by price control measures, but the control is by no means fully effective.

The government has also supplemented the system by entering the market itself. For example, arrangements have been made under the recent Trade Agreement with India for the import of cotton textiles and gunny bags, in part on government account. The government has also made direct purchases from abroad of its own requirements (e.g. tires). The effect has, however, not always been as intended, merchants being hesitant to buy with the prospect of large government stocks hanging over the market.

On the whole, a less complex system of import control would seem better suited to an economy like that of Iraq, whose requirements are likely to change in composition and to increase quite rapidly. Fewer regulations, more strictly enforced, are likely to serve better the two ends of social justice and public revenue.

Balance of Payments

The bulk of foreign transactions are carried out through the commercial banks, which are subject to exchange controls, or through government channels such as the National Bank. However, numerous transactions pass through other channels and many of them are virtually impossible to estimate. For this reason the Mission has not attempted to construct a true balance of payments. Table 14 shows the foreign exchange transactions passing through the principal official channels, so far as they are known to the Mission. The other items which would enter into a complete balance of payments are discussed subsequently.

As will be seen, even this account, which it should ordinarily be possible to balance, is subject to a wide margin of error for which no explanation is available. The general significance of the

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TABLE 14

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OFFICIAL EXCHANGE TRANSACTIONS—1949 AND 1950
(in millions of dinars)

	1949		1950	
I. ITEMS NOT INVOLVING THE OIL COMPANIES				
A. Trade				
Exports	+14.9		+20.6	
Imports	−20.0		−24.8	
		−5.1		−4.2
B. Other Current Items				
Transfers by RAF and foreign companies	+ 1.1		+ 1.3	
Interest and profits (net)	+ 0.4		+ 0.8	
Payments to Crown Agents and foreign contractors	− 0.4		− 2.2	
Other items (net)	− 2.2		− 2.8	
		−1.1		−2.9
C. Capital Items				
Private transfers (net)	− 0.1		+ 0.5	
Public transfers	—		+ 2.5	
		−0.1		+3.0
II. ITEMS INVOLVING THE OIL COMPANIES				
Transfer for local expenditure (IPC Group)	+ 6.7		+ 4.4	
Transfer for local expenditure (AIOC)	+ 1.1		+ 0.3	
Royalties, etc. (IPC group)	+ 2.1		+ 3.2	
Net advances (IPC group)	− 1.0		+ 1.0	
		+8.9		+8.9
		+2.7		+4.8
III. ERRORS AND OMISSIONS		−3.9		+1.8
IV. INCREASE (+) OR DECREASE (−) IN FOREIGN BALANCES OF THE NATIONAL AND COMMERCIAL BANKS		−1.2		+6.6

table is, however, clear. The transfers made by the oil companies have financed a considerable deficit in trade and a smaller one on other items.

The accounts presented above, however, do not by any means

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include all foreign transactions. There are, in addition, three major self-balancing accounts. In the first place, there are the additional operations of the IPC group. Goods valued at ID 9,200,000 in 1949 and at ID 7,400,000 in 1950 were imported on their own account by the IPC group for use in their operations, while 3,700,000 and 6,000,000 tons respectively of oil were exported and a small quantity of equipment re-exported. Theoretically it would be possible to enter these items in a balance of payments as merchandise trade and, after subtracting local expenditure and royalties, offset them by appropriate entries for investment and profits. As they do not, in fact, affect the exchange position, it is simpler to omit them than to make what are necessarily arbitrary calculations.

Secondly, there is an important group of transactions by the AIOC and its associated distributing and producing companies, the ROC and the KOC. The ROC imported about ID 1,000,000 worth of goods, mainly petroleum products, in each year. The net proceeds of the sale in Iraq of imported and locally produced petroleum products, after deduction of local expenses and taxes, were for the most part placed in special local accounts on which the AIOC drew to pay for certain expenses in Iraq. The principal items were various shipping dues in the Shatt al Arab amounting to somewhat more than ID 1,000,000 and building materials exported from Basra. The final balancing item was an increase or decrease in the accumulated balances in the AIOC's or the ROC's local accounts, i.e., an increase or decrease in Iraq's liabilities in foreign dinar accounts. It is known that in 1950 there was a considerable accumulation of unused funds by the ROC.

Finally, there is a considerable body of transactions, mainly illegal, which do not pass through official channels. The approximate value of trade not accounted for in the items already discussed is shown in Table 15.

Part of the discrepancy may be explained on grounds of the difference in timing between receipt or dispatch of the goods themselves and payment therefor. Furthermore, the customs returns overestimate imports by recording the valuation of the major part of these goods c.i.f. Baghdad or Mosul, thus including transportation inside Iraq. Some items, which were really trade, may have been included under other headings (e.g. payments to the Crown

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TABLE 15

MERCHANDISE TRADE
(in millions of dinars)

	1949		1950	
	Exports	Imports	Exports	Imports
Customs returns	12.4	40.5	22.0	37.6
Less				
Oil Companies trade	− 0.7	−10.3	− 0.8	− 8.4
"Officially" financed	−14.9	−20.0	−20.6	−24.8
Discrepancy	− 3.2	10.2	0.6	4.4

Agents). But the principal explanation of the large amount of residual imports is the import of goods "without foreign exchange." Licenses issued (but not necessarily used) amounted to ID 10,800,000 and 7,400,000 in 1949 and 1950. These were paid for with foreign exchange acquired by the methods already described. Part of this foreign exchange was, no doubt, also used for travel abroad, particularly in the Lebanon. Insofar as receipts and expenditures in "unofficial" foreign exchange did not balance in any one year, there must have been a balancing item in these transactions, representing capital export or import. No data is available on this, but it is generally believed that there has been a considerable export of capital in recent years.

IX. Government and the Economy

Until recently the goverment, handicapped primarily by a shortage of funds, played a comparatively modest role in promoting economic life. In agriculture the main effort was confined to the production and distribution of seeds, the promotion of cotton and citrus culture and the combating of diseases and pests, particularly the locusts. Some help was given through the establishment of the Agricultural Bank and of a government organization for the rental of agricultural machinery. One project for the settlement of smallholders on newly irrigated government land in the Dujaila district near Kut was initiated. Outlays on irrigation and flood control,

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however, had to be kept small. In the field of industry the government sought to stimulate private enterprise by according special tax benefits and protection and by establishing the Industrial Bank.

The Development Board

With the prospect of a rapid rise in oil production and therefore in government oil revenues, the promise of a much wider field of activity developed. Accordingly a law was enacted in 1950 establishing a Development Board and assigning to it all the oil revenues as well as the proceeds of any loans contracted by it or by the government on its behalf. The Board consists of two ex officio members—the Prime Minister, who functions as its president, and the Minister of Finance—and six executive members appointed for five years. The Board was directed to draw up a general program for the development of Iraq and, upon its approval by Parliament, to proceed with the detailed plans and specifications of the projects included in the program and with their execution in accordance with an approved order of priorities. Each year any revisions in the program, an annual budget and an annual report are to be presented to the Parliament. The Board is also to consider and coordinate development schemes which may originate in the various ministries of the government.

The establishment of this Board is evidence of the government's determination to see the extraordinary oil revenues used for developing the country's resources and raising the standard of living and to insure some continuity in development which frequent changes in governments have made virtually impossible in the past.

The Board was constituted and began operations toward the end of 1950. The British and American governments each nominated one of the executive members in accordance with a request by Iraq. In the spring of 1951 the Board submitted its preliminary over-all program involving a total outlay of ID 65,674,000 over a five-year period beginning with the fiscal year 1951-52. About ID 29,401,000 of the Board's projected revenues, consisting of the income from oil anticipated at that time and nearly all of the proceeds of the $12.8 million loan obtained from the International Bank for the Wadi Tharthar flood control project, were reserved

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for subsequent programming. Expenditures for the five-year period were allocated by broad fields as follows (in dinars):[5]

Water storage and irrigation schemes	30,044,000
Roads	15,826,000
Buildings, including hospitals and schools	12,618,000
Miscellaneous projects	6,216,000
Administrative expenditures	970,000
Unprogrammed reserve	29,401,000

Because of the brief time devoted to its preparation, this program will necessarily undergo modification as more detailed study is given to requirements and the cost of individual projects and as some of the over-all allocations are programmed in detail.

The magnitude of this projected outlay is in startling contrast to the financial stringency which has characterized public expenditures in the past. The government has had great difficulty in making both ends meet. Severe economy has been the rule. Development outlays were pared; government salaries were not increased despite the increasing cost of living; and local administration was starved of funds.

Government Budgets

The trend of government finances is indicated in Table 16.

It will be noted that, despite economies and tax increases, the government's total budget showed substantial deficit in 1948-49 and 1949-50, primarily because of the bad harvests in 1947 and 1948 and the effects of the war with Israel. Of the government's principal autonomous enterprises, the railways also ran considerable deficits on capital account which were defrayed only by using reserve funds, by borrowing ID 1,000,000 from the government and contracting a loan of ID 3,000,000 through the Export Credits Guaranty Department of the British Government. The Iraqi government borrowed at home to meet its own needs, its domestic debt rising from ID 4,500,000 on March 31, 1948, to ID 10,800,000 on March 31, 1951. Borrowing had to be limited, however, because the market for government securities was virtually restricted to the banking system. As of March 31, 1951, the National Bank and the commercial banks held ID 9,200,000 of the domestic debt.

[5] For a more detailed breakdown, see Table V in Appendix.

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TABLE 16

BUDGETS OF THE GOVERNMENT AND PRINCIPAL GOVERNMENT ENTERPRISES

(in millions of dinars)

	1947-48	1948-49	1949-50	1950-51 (provisional)	1951-52[1] (estimate)
GOVERNMENT BUDGET					
Ordinary					
Revenues	21.2	21.2	23.8	26.1	28.2
Expenditures	23.0	28.1	26.6	25.9	29.1[2]
Balance	−1.8	−6.9	−2.8	+0.2	−0.9
Capital					
Revenues	4.8	2.5	3.8	5.1	—
Expenditures	3.6	3.9	3.4	3.8	—
Balance	+1.2	−1.4	+0.4	+1.3	—
Total					
Revenues	26.0	23.7	27.6	31.2	28.2
Expenditures	26.6	32.0	30.0	29.7	29.1
Balance	−0.6	−8.3	−2.4	+1.5	−0.9
RAILWAYS BUDGET					
Revenues	3.8	3.6	4.0	4.0	4.2
Expenditures, (including capital)	5.3	6.4	4.8	4.3	5.2
Balance	−1.5	−2.8	−0.8	−0.3	−1.0
PORT AND FAO BAR BUDGETS					
Revenues	2.3	2.6	2.6	2.4	2.5
Expenditures, (including capital)	2.1	2.4	2.4	3.2	4.1
Balance	+0.2	+0.2	+0.2	−0.8	−1.6

[1] With the establishment of the Development Board the latter's budget has replaced the government's regular capital budget. In its 1951-52 budget, however, the government has still incorporated income from oil produced in the first quarter of the calendar year 1951 and is planning to devote this revenue to a number of projects including a government spinning and weaving mill (ID 1,000,000), a small-loans bank (ID 250,000), establishment of a National Insurance Company (ID 50,000), army buildings and equipment (ID 464,000), and the initial cost of an oil refinery (ID 250,000).

[2] Since the original approval of the budget the government has apparently issued three ordinances raising total authorized expenditures by about ID 2.7 million.

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TABLE 17

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GOVERNMENT DEBT

(in millions of dinars as of March 31)

	1948	1949	1950	1951
Domestic debt				
Treasury bills	1.5	4.6	4.3	4.8
Bonds	3.0	6.0	6.0	6.0
Total	4.5	10.6	10.3	10.8
Foreign debt	—	—	—	3.0*
Grand Total	4.5	10.6	10.3	13.8

* Contracted on behalf of the railways.

Features of Government Expenditures

Certain characteristic features of government expenditures in recent years are set forth in Table 18. Outlays on defense and police have absorbed well over one third of the total budget. On the other hand, expenditures on agriculture and irrigation which are of critical importance to the economy have been very small and in 1949-50 were even further reduced so that they represented only

TABLE 18

SOME GOVERNMENT OUTLAYS BY TYPE

(in millions of dinars)

	1948-49		1949-50		1950-51 (est.)	
	Amount	Percentage of total budget	Amount	Percentage of total budget	Amount	Percentage of total budget
Defense and police	11.4	35.6	11.1	37.0	10.9	36.7
Agriculture and irrigation	2.5	7.8	1.6	5.3	1.6	5.4
Education	2.6	8.1	2.6	8.7	3.8	12.8
Health and other social services	2.0	6.2	1.7	5.7	2.4	8.1
Public Works and housing*	1.8	5.7	1.2	4.0	2.0	6.8

* Includes expenditures of Public Works Department in the ordinary budget and expenditures on public works, including communications, but excluding irrigation, in the capital budget.

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a little over five percent of the total. Expenditures on education, health and other social services, although still very inadequate, rose slightly so that they absorbed almost 21 percent of the total budget in 1951. Capital outlays have been extremely modest. Total new government investment outlays for civilian purposes have averaged only ID 2,700,000 annually in the period 1948-49 to 1950-51. Expenditures on public works and housing, excluding irrigation, absorbed on the average less than six percent of total government outlays in this period.

Economies have also been effected in recent years at the expense of the municipal and provincial administrations. By law, these were supposed to have assigned to them, in equal shares, the proceeds of the property and petrol taxes less the expenses of collection incurred by the central government. Actually very little of these taxes has been turned over to the local and provincial governments. For example, in the three years 1947-48 to 1949-50 the provincial administrations received only ID 175,000 out of a total of ID 2,626,000 due to them. Municipalities were similarly handicapped. The ability of local governments to carry out improvements and even to maintain existing facilities was correspondingly curtailed.

Characteristic Features of Government Revenues

The fiscal system in the past has been characterized by (1) the high proportion of revenues derived from indirect taxation, (2) light taxation of agriculture, and (3) considerable tax evasion and poor tax collection.

Indirect taxation is generally predominant in all underdeveloped countries, and Iraq is no exception. In the three-year period 1948-49 to 1950-51 indirect taxes contributed about 82 percent of all tax income and 59 percent of total budget receipts. Customs duties and excises accounted during these years for 71.5 percent of total revenues from indirect taxes, while taxes on agricultural produce, fish, and livestock brought to market (the so-called *istihlak* and *koda* taxes) contributed most of the remainder. Direct taxes—the so-called land tax, the property tax and the income tax—accounted for only 18 percent of total tax revenues and 13 percent of all government receipts. Income and surtaxes

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651 have yielded only about ID 2,400,000 annually in recent years because income from agriculture and urban property is exempt and rather sweeping exemptions or reductions have also been accorded to Iraqi-owned industrial enterprises. The three principal oil companies have also not been required to pay income taxes in return for annual payments in commutation of all taxes. Income and surtaxes thus bear primarily on salaried employees and individuals and companies engaged in commerce. In 1948-49 all Iraqi companies paid only ID 259,000 in income and surtaxes as compared with ID 488,000 paid by foreign companies.

Both land devoted to agriculture and income from agriculture largely escape taxation. A land tax, assessed in accordance with a very complicated set of criteria, was levied until 1931 when it was replaced by a 10 percent tax called *istihlak* on agricultural 651 produce brought to designated centers, presumably for sale. At the 427 same time, the government enacted a Law for the Collection of Land Rent which, after its revision in 1936, came to be called erroneously a land tax. Actually it was a compound of a rent charge on all lands except those alienated in *tapu* to which the state had retained the ultimate title, and a tax on water whether supplied by flow or by pump. The "rent" element was supposed to equal about five percent of the value of the crop and the "water" charge between two and 10 percent, depending on whether the land was irrigated by pump or by flow, and, if by flow, whether or not the flow was regular and assured. The total charges were assessed by various criteria. For government lands, which were regularly leased, they were set either by auction or by triennial assessment of the type and amount of crops grown on the land. This levy, which itself was circumscribed by a number of exemptions, was abolished in 1939, except for *miri* lands leased regularly by the government, in return for certain payments over a maximum period of 10 years. In view of the subsequent inflation these 651 proved to be rather light. Thus virtually the only remaining agricultural tax is the *istihlak*. During recent years this tax has varied from 10 to 12½ percent of the value of produce brought to market as fixed on the basis of market prices. The *istihlak*, however, is paid by the buyer rather than the seller, although the producer may actually bear it insofar as prices are set in the export market

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TABLE 19

Composition of Government Receipts

(in millions of dinars)

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	Actual results			Estimates
	1948-49	1949-50	1950-51[1]	1951-52
A. Taxes				
Direct taxes:				
Land tax [2]	0.6	0.4	0.4	0.4
Property tax	0.6	0.8	0.8	0.6
Income tax	2.2	2.4	2.4	1.7
Total direct taxes	3.4	3.6	3.6	2.7
Indirect taxes:				
Turnover tax on agricultural produce and animals	3.2	3.6	4.6	4.7
Customs, Excises	9.8	11.3	13.0	9.4 / 3.1
Stamp duties	0.5	0.5	0.5	0.6
Tobacco Monopoly (net)[3]	0.3	0.4	n.a.	1.2
Total indirect taxes	13.8	15.8	18.1	19.0
Total tax receipts	17.2	19.4	21.7	21.7
B. Other receipts				
Share in National Bank's profits	—	—	0.6	0.7
Oil royalties	2.0	3.2	5.0	1.8[4]
Posts and telegraphs (gross)	1.0	1.1	1.2	1.2
All other receipts	3.0	3.3	2.6	2.8
Total other receipts	6.0	7.6	9.4	6.5
Grand Total	23.2	27.0	21.1	28.2

[1] Preliminary.

[2] Actually a tax in respect of land rent and water rights.

[3] The amount credited to the budget does not represent the actual surplus of the Monopoly's cash receipts over expenditures which amounted to ID 2,200,000 in 1948-49 and ID 1,200,000 in 1949-50. The Monopoly's "accounting" contribution to the budget is computed by (1) taking the difference between cash income and cash expenditures realized by the Monopoly in its transactions in tobacco, tombak and cigarette paper, (2) adding or subtracting the net charge in the value of the Monopoly's stocks during the year, and (3) adding sundry revenues from confiscated tobacco license fees, storage, etc. [655]

[4] Represents only royalties to be received on oil production in the first quarter of the 1950 calendar year, the remainder being credited to the Development Board.

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651 or prices cannot be correspondingly increased because domestic demand is too elastic.

At the same time, the tax system discriminates in favor of those who have managed to obtain state lands in *lazmah* grant and against those who have regularly leased land from the state. The latter continue to be assessed for rent whereas the former, who have frequently secured large *lazmah* grants on the basis of rather tenuous proof of occupancy and cultivation, escape any tax or rent assessments on their land.

Agriculture probably also profits to a greater extent than other sectors of the economy from tax evasion. It is generally acknowledged that only between 60 and 70 percent of the *istihlak* is actually collected and that part of the tax is collected at reduced rates by downgrading the produce subject to taxation. Moreover, many leaseholders of government land simply fail to pay the rent tax. Thus of the ID 874,552 assessed in 1949-50, only ID 185,715 was actually collected. The leaseholders in Amara province accounted for ID 669,000 of the arrears. Their failure to pay may reflect in part a feeling that they are the victims of the discrimination cited above.

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TABLE I-A

Land Classified According to Types of Tenure by Cadastral Survey up to February 8, 1951

CULTIVABLE LAND

(in donums)

Province	Total Area of Province	Area Classified						
		Mamlukah (Mulk)	Matrukah	Mawqufa (Waqf)	Miri Tapu	Miri Lazmah	Miri Sirf	Total
Baghdad	7,906,800	69,620	6,588	81,360	319,171	1,037,157	3,324,500	4,838,398
Kut	6,208,325	66	—	203	618,974	1,595,466	2,535,439	4,750,149
Kerbela	2,447,600	11	—	2,319	84,652	19,488	23,958	130,429
Basra	4,908,400	63,067	—	15,181	84,576	3,041	61,608	227,473
Amara	7,496,800	—	—	22	7,991	47,043	1,914,865	1,969,921
Diwaniya	5,981,600	28	92	—	187,791	840,588	307,405	1,335,905
Dulaim	18,428,400	6,669	—	13,840	123,181	432,201	3,579,990	4,155,882
Erbil	7,217,200	10	—	645	786,739	817,853	302,540	1,907,787
Suleimaniya	3,805,600	16	—	190	355,373	2,705	51,793	411,076
Mosul	20,129,200	56	913	170,914	2,979,610	1,099,525	7,775,652	12,026,669
Kirkuk	8,132,400	200	1,615	109,878	1,372,423	310,935	991,127	2,786,179
Hilla	2,100,000	3,489	37	27,976	573,148	758,091	262,092	1,624,834
Diyala	6,438,000	7,369	50	126,670	876,964	407,637	605,193	2,023,874
Muntafiq	5,832,400	—	—	—	—	—	—	—
Total	107,032,725	150,601	9,296	549,198	8,370,595	7,371,720	21,737,165	38,178,575

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TABLE 1-B

LAND CLASSIFIED ACCORDING TO TYPES OF TENURE BY CADASTRAL SURVEY UP TO FEBRUARY 8, 1951

UNCULTIVABLE LAND

(in donums)

Province	Total Area of Province	Area Classified						
		Mamlukah (Mulk)	Matrukah	Mawqufa (Waqf)	Miri Tapu	Miri Lazmah	Miri Sirf	Total
Baghdad	7,906,800	14,951	108,756	9,010	41,592	71,131	349,126	594,567
Kut	6,208,325	20	54,148	192	127,504	152,311	1,124,000	1,458,176
Kerbela	2,447,600	96	3,872	160	26,391	1,637	868,073	900,229
Basra	4,908,400	4,447	21,372	441	6,613	113	748,587	781,575
Amara	7,496,800	258	9,271	57	202	7,595	836,648	854,032
Diwaniya	5,981,600	8	23,924	2	31,578	98,093	75,474	229,081
Dulaim	18,428,400	435	81,074	550	7,490	26,693	4,320,580	4,436,823
Erbil	7,217,200	517	202,888	813	9,326	5,970	162,132	381,646
Suleimaniya	3,805,600	15	117,982	2	1,250	—	12,873	132,113
Mosul	20,129,200	116	354,692	4,442	213,207	4,274	324,210	900,942
Kirkuk	8,132,400	135	621,893	2,503	42,381	632	160,035	827,570
Hilla	2,100,000	182	37,821	3,158	65,532	65,442	192,575	364,711
Diyala	6,438,000	1,186	49,218	15,206	125,927	51,408	164,050	406,996
Muntafiq	5,832,400	—	—	—	—	—	—	—
Total	107,032,725	22,366	1,686,912	36,538	698,897	485,291	9,338,365	12,268,459

TABLE I-C

Land Classified According to Types of Tenure by Cadastral Survey up to February 8, 1951

TOTAL, CULTIVABLE AND UNCULTIVABLE LAND

(in donums)

Province	Total Area of Province	Area Classified						
		Mamlukah (Mulk)	Matrukah	Mawqufa (Waqf)	Miri Tapu	Miri Lazmah	Miri Sirf	Grand Total
Baghdad	7,906,800	84,571	115,344	90,370	360,763	1,108,288	3,673,626	5,432,965
Kut	6,208,325	86	54,148	395	746,478	1,747,771	3,659,439	6,208,325
Kerbela	2,447,600	107	3,872	2,479	111,043	21,125	891,931	1,030,658
Basra	4,908,400	67,514	21,372	15,622	91,289	3,154	810,195	1,009,048
Amara	7,496,800	258	9,271	79	8,193	54,638	2,751,513	2,823,953
Diwaniya	5,981,600	36	24,016	2	219,369	938,681	382,879	1,564,986
Dulaim	18,428,400	7,104	81,074	14,390	130,671	458,894	7,900,570	8,592,705
Erbil	7,217,200	527	202,888	1,458	796,065	823,823	464,672	2,289,433
Suleimaniya	3,805,600	31	117,982	192	356,623	2,705	64,666	543,189
Mosul	20,129,200	172	355,605	175,356	3,192,817	1,103,799	8,099,862	12,927,611
Kirkuk	8,132,400	335	623,508	112,381	1,414,804	311,567	1,115,162	3,613,749
Hilla	2,100,000	3,671	37,858	31,134	638,680	823,532	454,667	1,989,545
Diyala	6,438,000	8,555	49,268	141,876	2,136,892	459,045	769,243	2,430,870
Muntafiq	5,832,400	—	—	—	—	—	—	—
Total	107,032,725	172,967	1,696,208	585,736	9,069,582	7,857,011	31,075,530	50,447,034

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TABLE II

Monthly Statements of the National Bank of Iraq

(In thousands of dinars)

End of Month	Consolidated Accounts of Issue and Banking Departments[1]									
	Liabilities					Assets				
	Capital & Reserves	Currency in Circulation	Current Accounts	Other Accounts	Total	Sterling	Silver	Iraq Securities	Advances[2]	Other
Oct. 1949	2,500	35,913	354	1,863	40,630	34,707	157	5,620	55	91
Dec. 1949	2,500	36,356	338	1,891	41,085	35,137	151	5,620	125	53
Mar. 1950	2,500	38,634	3,160	2,109	46,403	39,843	152	6,120	225	63
June 1950	2,500	39,282	3,930	1,871	47,583	40,859	155	6,160	353	56
Sept. 1950	2,500	37,813	4,617	2,520	47,450	40,278	161	6,160	798	53
Dec. 1950	2,500	39,096	4,877	2,685	49,159	41,885	155	6,160	910	50
Mar. 1951	2,942	40,566	3,345	1,863	48,717	41,700	154	6,160	650	53

[1] This table omits the currency held by the Banking Department, which appears in its accounts as an asset and in the Issue Department's accounts as a liability.

[2] Includes advances made to the Industrial Bank, Mortgage Bank, Baghdad Water Board. As of July 1950 advance of 1949 government share of National Bank profits also included.

TABLE III

Consolidated Statement of Assets and Liabilities of Five Commercial Banks

(in dinars)

ASSETS	Feb. 28, 1950	Feb. 28, 1951
Notes and coin in Iraqi currency..	3,217,543	5,140,227
Credit balances with branches and licensed banks in Iraq.....	1,806,774	3,366,131
Deposits with National Bank.....	3,271,104	5,549,794
Investments, advances and discounts in Iraq:		
Government loans	2,578,083	2,176,315
Bills discounted	813,129	958,506
Advances	4,338,362	6,384,214
Investments	357,276	435,683
Sundry	31,650	57,188
Deposits and investments payable abroad:		
Foreign government securities	3,502,870	2,252,870
Other	7,418,652	9,169,608
All other	534,327	217,170
Total	27,869,770	35,707,706

LIABILITIES	Feb. 28, 1950	Feb. 28, 1951
Paid-up capital	1,650,000	1,800,000
Reserves and provisions.....	386,723	605,576
Balance profit and loss account....	142,682	164,205
Debit balances with branches and licensed banks in Iraq.....	1,936,609	3,637,427
Liabilities against credits opened	2,659,820	5,344,375
Demand deposits	13,770,021	13,759,800
Time deposits	767,889	613,814
Sundry creditors	155,775	573,498
All other, including government and quasi-government deposits	6,400,251	9,209,011
Total	27,869,770	35,707,706

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TABLE IV

Expenditures Projected by the Development Board

(in millions of dinars)

	1951-52	1952-53	1953-54	1954-55	1955-56	Total
Irrigation projects:						
Wadi Tharthar	1.3	3.6	3.1	1.5	0.2	9.6
Habbaniya	0.5	0.5	0.5	0.7	—	2.1
Diyala Reservoir	0.2	0.7	1.1	2.2	1.9	6.1
Dokan Reservoir	0.2	0.7	1.0	1.8	2.0	5.7
General drainage	0.2	0.3	0.5	0.5	0.5	2.0
Other irrigation projects:						
New projects	0.4	0.9	1.2	0.9	0.9	4.2
Completion of projects begun previously	0.3	—	—	—	—	0.3
Total	3.0	6.6	7.4	7.5	5.5	30.0
Roads and bridges:						
Main roads across Iraq from south to north (Basra - Baghdad, Kirkuk, etc.)	0.8	1.3	1.5	1.5	1.5	6.6
Other roads	1.3	2.1	2.1	2.0	1.9	9.4
Total	2.1	3.4	3.6	3.5	3.5	15.9
Buildings:						
Hospitals	0.7	0.7	0.7	0.8	0.9	3.8
Schools	0.7	0.7	0.7	0.8	0.9	3.8
Other buildings	1.0	0.9	1.1	1.1	1.1	5.0
Total	2.4	2.3	2.5	2.7	2.9	12.6
Other projects:						
Small settlement projects	0.2	0.3	0.3	0.3	0.3	1.2
Artesian wells and water for drinking purposes	0.2	0.3	0.3	0.3	0.3	1.2
Special projects in northern Iraq	0.3	0.3	0.3	0.3	0.3	1.3
Reforestation and filling of swamps and marshes	0.1	0.1	0.1	0.1	0.1	0.5
Telegraphs & telephones	0.5	—	—	—	—	0.5
Other projects	0.2	0.1	0.1	—	—	0.4
Expropriations	0.3	0.3	0.3	0.3	—	1.1
Total	1.7	1.2	1.2	1.1	0.9	6.2
Administrative expenses	0.2	0.2	0.2	0.2	0.2	1.0
Grand Total	9.4	13.7	14.8	15.0	12.8	65.7

Note—Totals do not necessarily add up because of rounding.

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ANNEX B

FLOOD CONTROL, IRRIGATION AND DRAINAGE

Effective and economical utilization of available water resources is the central problem of Iraq.[1] In its study of this problem the Mission has addressed itself to (1) the storage of water for the purpose of controlling floods and increasing the regular supply of water for irrigation, (2) the expansion of irrigation, (3) the provision of drainage to prevent deterioration of irrigated lands by salt, and (4) questions of operation and maintenance of irrigation systems. The Mission has relied heavily on published materials ranging from the *Report on the Irrigation of Mesopotamia* by Sir William Willcocks, published in 1911, to more recent studies, particularly the monumental *Report on the Control of the Rivers of Iraq and the Utilization of their Waters* made in 1949 by the Irrigation Development Commission under the presidency of Mr. F. F. Haigh. In addition, however, the Mission conducted a field survey, in the course of which one or more of its members visited the sites of proposed dams and reservoirs, and examined the problems of irrigation at first hand. Its conclusions are therefore based on observation as well as the study of relevant documents.

I. Water Storage

Today the storage of the flood waters of the Euphrates and Tigris and their tributaries is the foremost problem. The twin rivers carry, on the average, almost 70 billion cubic meters of water per year—a quantity theoretically adequate to irrigate vast areas. Much of this comes, however, in the spring at a time too

[1] See the Mission's main report, p. 7 *et seq.*; also Annex A, *Basic Factors and Conditions.*

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312 133 [731] late to benefit winter crops and too early for summer crops. Destructive spring floods are apt to occur just before the harvesting of the winter crops begins and as the planting of summer crops is in process. In the dry season—July to December—which is critical for both summer and winter crops, the mean discharge of the Euphrates at Hit and the Tigris at Baghdad is only 421 cumecs (cubic meters per second) and 559 cumecs, respectively, as compared with 1,765 cumecs and 2,572 cumecs during the three peak months of the spring.[2] The Haigh Commission has calculated that the mean discharge which can be relied upon for irrigation is only 280 cumecs for the Euphrates and 350 cumecs for the Tigris and its tributaries. This supply would appear to be barely equal to the water needed for existing irrigation systems when figured on the basis of the standards usually applied in Iraq. In fact, at present there is an acute shortage of water in the irrigated areas of the Diyala Valley and the Hilla canal system while in other areas water is wasted. Short of radical economies in the use of water, which can only be realized over the long term, no significant extension of the irrigated area can be undertaken without controlling and regulating the flow of the rivers. Nor can disastrous floods be controlled without schemes for the storage of the excess waters.

The Euphrates

663 312 A project for the regulated diversion of the flood waters of the Euphrates into Lake Habbaniya is already under way. This project involves the construction of an inlet channel from the Euphrates near Ramadi to the lake as well as an outlet channel for the later release of the stored waters. A barrage will be built across the Euphrates at Warrar to raise the water level and thus permit an increase in the capacity of the lake reservoir. The outlet channel and regulator are already finished and work is well advanced on the inlet channel and its regulator. The project when completed will reduce the flood discharge from a possible maximum of 5,200 cumecs to 2,000 cumecs and will increase the minimum supply of water available for irrigation from 280 cumecs to perhaps 440 cumecs. The total cost is estimated at ID 4,300,000.

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[2] See chart and also Tables I and II in the appendix.

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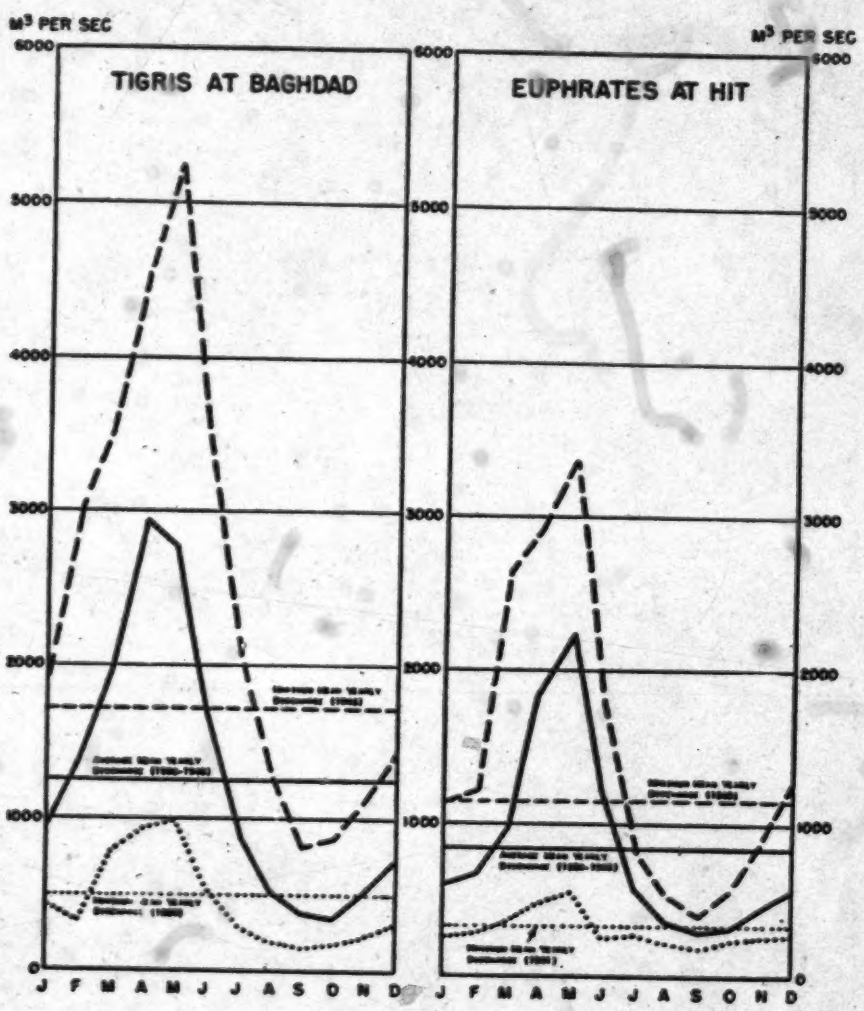
HYDROGRAPHS OF THE TIGRIS AND EUPHRATES RIVERS 133 312

——— Average Mean Monthly Discharge

– – – – Minimum Mean Monthly Discharge

——— Maximum Mean Monthly Discharge



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While the soundness of the scheme is beyond question, the Mission has serious reservations about extending the storage capacity of the project by evacuating part of the water in Lake Habbaniya to the nearby depressions of Bahr el Milh and Abu Dibis through the discharge channel of Mujarrah. The Haigh Commission contemplated that with the reservoir formed by these depressions the maximum flood discharge could be further reduced to 1,500 cumecs and the water available for irrigation could be raised to 510 cumecs. In the opinion of the Mission, however, the salt in these depressions would be a serious obstacle to their use as a reservoir for irrigation water. The use of the stored water of Lake Habbaniya would in itself tend to raise the salt content of the Euphrates to the maximum concentration considered usable for irrigation. Since the lake is said to contain about two million tons of salt, and the waters of the Euphrates entering the lake themselves contain some salt, the waters of the lake at the capacity set by the 49.5 meters contour may reach a salt content of 100 parts per 100,000. These waters when mixed half and half with those of the Euphrates, which have a maximum salinity of 40 parts per 100,000, will tend to have a salt concentration of 70 per 100,000 or approximately the maximum tolerance. The Bahr el Milh and Abu Dibis depressions, however, now contain about 44 million tons of salt. The 20.5 billion cubic meters of water which might be stored in these depressions would therefore have a salinity of 215 parts per 100,000. It would be necessary to remove 27 million tons of salt in order to reduce salinity to 80 parts per 100,000. The Haigh Commission thought it possible to achieve this lower salt content in approximately four years by progressively evacuating the stored water into the Euphrates, but at a rate which would not raise the salt in the Euphrates itself over 80 parts in 100,000. Even granting this possibility, the Mission believes, however, that the resulting salt content would still be too high for irrigation water.

As a minimum, the Mission strongly suggests that any project for storing water in these two depressions be deferred until the problem of salting, already acute, has been brought under control by the installation of drainage facilities in the irrigated areas of the Euphrates Valley. At the same time it would be advisable to explore the possibility of alternative storage capacity somewhere

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along the Euphrates. Of several possible sites, the best appears to be at Rawa, a few kilometers upstream from Ana. There a dam 35 to 40 meters in height could be erected to create a reservoir with a capacity of seven billion cubic meters and an area of 480 square kilometers. The water would be backed up over a distance of 200 kilometers of which 60 kilometers would be in Syria. No geologic study of this possible dam emplacement has been made. An examination of outcroppings shows a series of horizontal layers in which soft but fairly compact limestone alternates with layers of highly decomposed rock and layers of soluble gypsum. While these surface indications raise serious doubt concerning the watertightness of the possible reservoir, the Mission urges that a geologic study of the site, supported by soundings, be carried out in order to obtain a geologic cross-section in the neighborhood of the projected dam emplacement.

The Tigris

Flood control on the Tigris is to be assured by the Wadi Tharthar project. A contract for the work on part of this scheme was awarded in the fall of 1951. The project involves the erection of a barrage across the Tigris, north of Samarra, to limit the flood discharge of the river to about 3,500 cumecs and divert the excess waters via an inlet channel into the Wadi Tharthar depression. At a contour of 60 meters the depression is expected to hold about 68 billion cubic meters of water in a reservoir extending over 2,050 square kilometers. The total cost of this project, for which the International Bank for Reconstruction and Development provided a loan of $12,800,000 in June 1950, has been budgeted by the Development Board at a figure of ID 9,625,000.

The efficacy of the Wadi Tharthar as a flood control scheme is clear. That the depression is sufficiently watertight to store enough water for irrigation is less certain. The Haigh Commission and its geologist had no doubt on this score, but other experts, including the one who served as government geologist until recently, have raised serious questions regarding the tightness of the reservoir.* Two firms of consulting engineers—Messrs. Coode, Vaughan-Lee, Frank and Gwyther, and Sir William Halcrows and Partners—have advised that the Wadi Tharthar project be considered exclusively for flood control. In any event, it would take about ten years

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for the reservoir to fill to the level at which water might be supplied for irrigation, and this water would then be available only for use in the Tigris Valley from Baghdad south. Thus other schemes for the storage of water for irrigation have to be considered.

From time to time storage dams for the Upper Tigris have been suggested, some with the obvious hope that they would cater to the needs of the North where rainfall is unreliable and does not permit the cultivation of summer crops. Among the sites proposed are two north of Mosul. One is near the village of Zumar about 115 kilometers from Mosul. The topographic features there would permit the creation of a storage basin, but geologic conditions appear to be very unfavorable. The soil consists of badly decomposed and fissured Lower Fars limestone and of marl which is also more or less decomposed. While no geologic investigation of the site has been made, borings made by the Mosul Petroleum Company about 10 kilometers away indicate the presence of numerous permeable layers in this area through which large amounts of water would probably be lost. Despite these prima facie doubts about the water tightness of the reservoir, the Mission believes that a complete geologic study, including borings, should be made of the site because of the understandable interest in this project in the North.

Conditions at the second site—Badosh, 25 kilometers above Mosul—are even less favorable. It has been suggested that with a dam 45 to 50 meters high a reservoir with a capacity of five billion cubic meters could be constituted. Outcroppings, however, disclose decomposed limestone with many caverns on this site. The dam would have to be built across a slight fold, cutting through various formations. Even with resort to costly and laborious injections of concrete, it is extremely doubtful that the proposed reservoir could be waterproofed.

Farther down the Tigris there is another possible dam site at Fatha where the river crosses a mountainous fold running northwest-southeast and known as Jebel Hamrin on the left bank and Jebel Mahul on the right bank. This site was studied in some detail by consulting engineers in 1940, and the investigation was resumed by the Haigh Commission in 1948. The Commission's geologist held that it would be impossible to build a gravity dam

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in the gorge itself but that an earthen dam farther upstream might be feasible. The dam would have to be about 3,500 meters long and, with a height of 75 meters and a fall board of six meters, could be used to store 24 billion cubic meters of water up to a contour of 182 meters. It could therefore be considered as an alternative to Wadi Tharthar and even as preferable since it would be likely to make more water available for irrigation. However, the anticipated cost of construction—about ID 20,000,000—and the vulnerability of an earthen dam to enemy attacks in time of war caused it to be rejected. Now that there no longer is any question of its consideration as an alternative to Wadi Tharthar, the possibility of a more modest project at Fatha might well be examined. A dam only 40 meters high could create a reservoir of five billion cubic meters which might some time in the future become of critical importance to irrigation. At the same time it would be so much smaller than the original project that the same objections concerning its safety could hardly be entertained. The Mission would therefore recommend further geologic studies and, particularly, a series of borings to determine definitely a geologic cross-section along the axis of the site.

The Tigris Tributaries

The Development Board has already provided in its five-year program for the construction of the Derbend-i-Khan dam on the Diyala river and the Dokan dam on the Lesser Zab river. The Mission agrees that these dam sites are the best available but suggests, as will be indicated in greater detail later, that these two projects be supplemented by the construction of the Bekhme dam on the Greater Zab river.

The Derbend-i-Khan Dam on the Diyala

Originally the Haigh Commission recommended that a dam be built at a point called Gibraltar where the Jebel Hamrin crosses the river. In 1950, however, Messrs. Coode, Vaughan-Lee, Frank and Gwyther and Sir William Halcrows and Partners expressed their preference for a dam at the Derbend-i-Khan defile farther upstream; and in 1951 the Development Board included this project at a total cost of ID 4,800,000 in its five-year program. The Mission considers this decision sound. The foundation soil at the

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Gibraltar site is soft sandstone sandwiched with layers of impermeable marl. The dam would have to be built of locally available sand and gravel, with an impervious facing in reinforced concrete or an impervious core; and it would be difficult to establish a watertight joint between the impervious facing and the impervious soil through the sandstone. The hills edging the reservoir show many low points where lines of seepage are so short as to create the risk of breaches. The presence of a lot of gypsum adds to the doubt about the watertightness of the reservoir. Moreover, its size and location are such that 128,000 masharas[3] of arable land would be submerged and 35 kilometers of railway detoured.

Borings have been made at the Derbend-i-Khan site and expert geologic opinion holds that the site provides a good foundation for a dam and has possibilities for a watertight reservoir. The rock-fill dam to be built will only close the breach, opened by centuries of erosion, in a solid rock sheath which, over long geologic periods, must have constituted the resistant part of a natural dam. The capacity of the dam will be only 0.87 billion cubic meters as compared with 1.56 billion for the Gibraltar dam. However, after allowing for losses, engineers believe that Derbend-i-Khan will provide a discharge of 80 cumecs at the Diyala weir, which governs the Diyala irrigation canals, as agaist 85 cumecs for Gibraltar. At present the usable mean discharge at the weir is only 38 cumecs.

The Dokan Dam on the Lesser Zab

A short distance from the Iranian border the Lesser Zab River passes through four gorges. According to competent geologic opinion, only the fourth of these, namely the Dokan Gorge, appears to offer a suitable dam site. The Dokan Gorge cuts through about 60 meters of Judean limestone covered by 40 meters of Shiranish limestone. Surface examination indicates that the former apparently consists of horizontal, generally sound beds, interspersed here and there, however, by caverns, while the Shiranish appears to be much more fissured. Up to the present only a brief geologic reconnaissance of the site has been carried out. Borings should be undertaken to confirm the surface indications and determine what special precautions should be taken in building the dam. The

[3] A mashara is equal to a donum (0.25 hectares or 0.617761 acres).

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geologic investigation should extend to the Shiranish limestone, for if this is found to be of adequate quality a higher dam and larger reservoir would be possible.

The construction of an arch dam at this site would be more economical than a gravity dam, but the proper planning and execution of such a dam requires much more skill. The Mission suggests that, after a thorough program of borings have shown the geologic conditions that will be encountered, the design and engineering of the dam should be entrusted to several consulting engineering firms so that the Development Board will be enabled to judge the best of different conceptions. So far as possible, all risks should be eliminated before construction commences. Soundness of conception and safety should not be sacrified in a desire to get things done rapidly.

An arch dam 60 meters in height would provide storage capacity for 1.99 million cubic meters at a level of 501 meters and for 2.21 million at a level of 508 meters. The usable mean discharge of the Lesser Zab would then be raised from about 63 cumecs to 108.5 and 149 cumecs at these respective levels.

The Bekhme Dam on the Greater Zab

The Haigh Commission made a complete geologic reconnaissance, including borings, of the possibilities of building a dam at two different sites in the Bekhme Gorge. It concluded that the Shiranish limestone at the upstream entrance to the gorge would provide a sound foundation for the construction of a high dam. The Commission was primarily interested in this dam as a flood control project, and, after deciding in favor of the Wadi Tharthar scheme, did not therefore include the dam in its program. The Development Board's five-year program also makes no provision for Bekhme.

The Mission urges, however, that construction of the Bekhme dam be undertaken as soon as possible. With the completion of the Dokan dam and related works it is planned to divert the waters of the Lesser Zab into the Adhaim River and use them for irrigating areas on the left bank of the Tigris and in the Diyala River Valley. Thus the Lesser Zab which has a usable flow of about 60 cumecs at present will no longer be supplying water to the Tigris.

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312 653 As a result irrigation in the Lower Tigris basin, particularly in the area served by the Shatt al Gharraf where water is already acutely short, would inevitably suffer in consequence unless water were made available from some alternative source. Although the deficit may be made good from the Wadi Tharthar in the end, it is by no means certain, as has already been pointed out, that the Wadi Tharthar depression will be able to supply water for irrigation. If the Wadi Tharthar reservoir can ultimately supply the Lower Tigris, it will still be possible to use the water stored behind the Bekhme dam for the irrigation of the Erbil plain in the North.

Nor should the cost be regarded as out of proportion to the results that will be achieved. In 1948 Messrs. Coode, Vaughan-Lee, Frank and Gwyther estimated the cost of a gravity dam in concrete at ID 9,000,000, but in 1950 they came to the conclusion that a buttress dam could be built at considerably lower cost, namely about ID 6,500,000. The dam would provide a net storage capacity of 1.66 billion cubic meters and would increase the usable discharge of the river from 128 cumecs to about 240 cumecs. This would furnish additional water sufficient to irrigate an area of two million masharas gross. On this area it would be possible to grow winter cereals on 828,000 masharas which might have a total value of ID 3,700,000, assuming conservatively a yield of one quarter of a ton per donum and a price of ID 18 per ton. If, in addition, summer crops were grown on one third of the area devoted to winter crops and yielded about the same value per mashara, the total value of the crops grown on the area of two million masharas gross could be put at about ID 5,000,000 per year. The resulting increase in national income would far outweigh the cost of the scheme. Even the tax yield would exceed the cost of amortization.

International Agreements

312 648 The construction of these reservoirs makes it necessary to reach agreements with Syria, Turkey and Iran regarding the control of the waters of the Euphrates and Tigris. For the Euphrates this is particularly urgent because half of the course of the river is in Turkish and Syrian territory and nearly all of its basin is in a foreign country. There are irrigation possibilities in Syria which could seriously reduce the flow of water into Iraq. Works which would raise the water level 10 to 20 meters upstream would com-

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mand an area for irrigation of 1,000,000 to 1,360,000 masharas in Syria. Irrigation of 1,000,000 masharas would require a flow of almost 60 cumecs. In Turkey and Iran the mountainous nature of the watershed of the rivers makes it much less likely that significant quantities of water will be diverted for irrigation. With these countries, however, it will be important to reach agreements regarding joint anti-erosion measures. Such measures will effectively complement water-storage schemes as means of flood control, the more so since silting will otherwise substantially reduce the effective life of reservoirs. Cooperation in afforestation of the watershed areas of these rivers is therefore highly desirable.

At present no such agreements exist. With Syria, there is no accord whatever. With Iran, there is only an old protocol of 1914 governing the use of the waters of a small stream, the Gangir. A protocol annexed to the Treaty of Friendship and Good Neighborliness, concluded with Turkey on March 29, 1946, set up a flood-warning service, permitted Iraq to investigate possible sites for flood-control dams in Turkey and gave agreement in principle, subject to confirmation in each case, for construction of works recognized to be necessary. Turkey also undertook to inform Iraq of any contemplated works on any of the two rivers. The scope of the agreement is thus rather limited.

II. Irrigation Works

It is now necessary to consider what irrigation works will be needed to utilize the additional water that will ultimately be made available by the water reservoirs discussed above and what further works should be undertaken to ensure better utilization of water.

Aside from flood control, the most important consequence of the new reservoirs will be the expansion of the area under irrigation. As Table 1 indicates, the area now under irrigation has been estimated by the Haigh Commission at 12,696,000 masharas gross, of which 4,671,000 are irrigated by the waters of the Euphrates and 8,025,000 by those of the Tigris and its tributaries.

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TABLE 1

AREA WITHIN IRRIGATION SYSTEMS
(in 1000 masharas)

	Gross	Cultivated	Winter crop area irrigated	Mean discharge used for irrigation (in cumecs)
EUPHRATES				
Flow irrigation	3,109	2,666	1,160	161
Pump irrigation from canals	607	515	263	32
river	955	812	474	43
Total	4,671	3,993	1,897	236
TIGRIS*				
Flow irrigation	2,380	2,033	760	105
Pump irrigation from canals	1,060	901	400	49
river	3,020	2,567	1,280	115
Total	6,460	5,491	2,440	269
DIYALA				
Flow irrigation	1,350	1,148	572	74
Pump irrigation	215	183	92	8
Total	1,565	1,331	665	82
Grand Total	12,696	10,815	5,002	587

* Including tributaries other than the Diyala.

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3/2 In considering the areas which might be provided with new irrigation systems, the Mission has adopted certain standards and practices which have been generally accepted in the past. Among these are:

1. The amount of cultivated land (in winter crops) which can be irrigated effectively by a constant flow of one cumec measured at the intake of an irrigation system (i.e. the so-called irrigation duty) is 7,200 masharas or donums;
2. Half of the cultivable area within an irrigation system is left fallow during the winter crop season; and, since a given amount of water can generally irrigate an area in winter crops about four times as large as in summer crops, the area of an irrigation system is conceived in terms of the winter crop;

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3. The cultivable area within an irrigation system is about 85 percent of the gross area which includes the surface occupied by roads, villages, canals, etc.

The Mission does not regard the first two criteria as immutable. The indicated irrigation duty is certainly very low; and the Mission will make some suggestions regarding it in the subsequent discussion of problems of operation. The present fallow system practiced in agriculture should also not be regarded as sacrosanct. Through the use of fertilizers and the introduction of soil-building crops the proportion of fallow might well be considerably reduced. Since almost all of the land which will be newly irrigated will be opened to settlement by small-holders under prescribed conditions, the state will be in a good position to insist on better agricultural practices in such areas. With water stored in reservoirs, it will also be possible to regulate the distribution of water as between winter and summer crops. In the past the amount of water which has flown down the rivers at critical parts of the growing seasons has set an automatic limit on the area both in winter and summer crops. In the future, however, this flow will be subject to control through the release of stored water. The Mission therefore suggests that the government make a special study to determine what combination of winter and summer crops using a given quantity of water would yield the highest output for the manpower employed on the land. The outcome of this study as well as a re-examination of the fallow system may in the end affect the calculations of the gross area which needs to be covered by irrigation works in order to use a given supply of water.

The sequence in which new areas are to be supplied with irrigation is governed partly by purely technical factors. Within the limits set by these technical factors, however, the selection of the areas to be irrigated should take into account the agricultural value of the land, its proximity to potential settlers and its ownership. In making its recommendations regarding new irrigation systems, the Mission has sought to give appropriate weight to all these factors. It was not always possible to arrive at a considered judgment of the agricultural potentialities of various areas, so that on this ground alone its suggestions may be subject to revision. Regarding the ownership of lands which could be irrigated, the Mission had no information. Presumably most of this land is in

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3/1 state ownership. In any event, as long as it is technically feasible
3/2 and not more costly, it will be desirable to give preference to the irrigation of good agricultural land remaining in state ownership because such land can be used for distribution among small-holders.

Expansion of Irrigation—the Euphrates

3/2. Except for a narrow band on both banks of the Euphrates between Hit and Hindiya and some smaller areas along the lower Euphrates, which are irrigated directly from the river by pumps, the irrigation systems of the Euphrates are served by a series of canals whose off-takes are above the Hindiya barrage. Nine of these canals serve the left bank of the Euphrates[4]; and only two[5], the right bank. The Hindiya barrage was built primarily to increase the intake into the most important of these canals—the Hilla. This canal, together with its three terminal branches—the Diwaniya, Dagharrah and Hurriyah canals, is supposed to irrigate a gross area of 2,333,000 masharas. The supply of water, however, is sufficient to irrigate only about 35 percent of the cultivable area commanded by the Hilla canal system. It has already been recognized, therefore, that the additional water made available from the Habbaniya should, in the first instance, be used to increase the irrigation intensity in the Hilla canal system to the standard 50 percent. The Development Board has already reserved ID 900,000 to remodel the Hilla canal in order to bring about the necessary increase in its capacity from 114 to 175 cumecs at its head and from 57 to 87 cumecs at its tail. As will be noted below, an additional enlargement of the canal's capacity will be necessitated by further expansion of irrigation. While the Haigh Commission contemplated carrying out the required increase in capacity in two phases and proposed to rely partly on erosion as a means of attaining the needed capacity, the Mission believes it desirable to give the Hilla canal its final outline from the very beginning and to avoid reliance upon the rather erratic effects of erosion. At the same time, the course of the canal should be straightened and precautions taken to reduce losses by infiltration at the resulting low points.

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[4] Saqlawiyah, Abu Ghuraib, Yusufiyah, Latifiyah, Iskandiriyah, Musayib, Nasiriyah, Kifl and Hilla.

[5] Husseiniyah and Beni Hassan.

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It has already been mentioned that upon the completion of the Habbaniya project the usable flow of the Euphrates will be raised from 280 to 440 cumecs. Since the Hilla canal area will absorb 30 cumecs, the balance of the increase, or 130 cumecs, will be available for the extension of irrigation to a gross area of 2,200,000 masharas. To use this quantity of water the following irrigation projects are recommended: 312

1. Extension and enlargement of the Musayib and Iskandiriyah canals to irrigate an additional gross area of 228,000 masharas. The Development Board has already earmarked ID 400,000 for these works.
2. Prolongation of the Babil canal, which is at present only a secondary canal branching off from the Hilla, and increasing its capacity from eight to 65 cumecs so as to provide water for 670,000 masharas gross. For this purpose the capacity of the Hilla canal at its head will have to be raised to 229 cumecs.
3. Construction of a barrage below Kifl on a deviation of the Kufa branch of the Euphrates which would govern, on the right bank, a new canal intended to serve the Bahr el Najaf and, on the left bank, the Shamiya, a branch of the Euphrates which would thereby become a controlled canal with an enlarged capacity of 272 cumecs at its head. This would extend irrigation to a gross area of 590,000 masharas.
4. Construction of a feeder canal connecting the Shamiya with the Diwaniya, one of the branches of the Hilla canal, in order to irrigate a gross area of 385,000 masharas between Shamiya and Diwaniya and deliver a flow of water which would release about 38 cumecs at the tail of the Hilla canal for use elsewhere. This feeder, which would have a capacity of 237 cumecs at its head and of 184 cumecs at its junction with the Diwaniya, would be extended to serve the new Khar canal.
5. Irrigation of a gross area of 108,000 masharas in and immediately south of the Dagharrah canal area by remodelling the Dagharrah Canal and constructing the head of the Khar canal. The additional water for the Gagharrah would come from that released at the tail of the Hilla Canal as a result of the building of the Shamiya-Diwaniya feeder; and that for the Khar canal would come from the expanded supply of the Diwaniya.
6. Additional construction of the Khar canal to irrigate about 220,000 masharas gross.

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312 The Mission suggests that detailed plans of these irrigation works be made as soon as possible in order to make sure that this program is completed by the time the Habbaniya project is finished. Execution of this program will require some agricultural adjustments in the Shamiya area where rice is now grown under conditions of natural inundation. By controlling the Shamiya and installing a flow-irrigation system the area available for winter cultivation will be greatly increased, but at the same time rice cultivation may have to be curtailed. In any event, the fellahin will have to grow rice not on naturally flooded land, but on terraced plots watered successively from canals. At the same time fertilizer rather than silt brought by the floods will have to be used to maintain the productivity of the rice lands. As the Haigh Commission has already noted, these adjustments would in the end have to be made anyway, owing to the progressive silting of the rice lands which is gradually raising them to levels where they can no longer be flooded. The Department of Agriculture should take timely steps to assist the fellahin to adapt themselves to the new conditions.

Other Irrigation Works on the Euphrates

Aside from the works required to expand the area under irrigation, certain other irrigation works on the Euphrates appear to be necessary. The Development Board has already set aside ID 250,000 for improving the Shamiya, one of the branches into which the Euphrates divides below Kifl, and controlling the erosion phenomenon known as the *nagarah* which threatens to dry up the whole rice-growing district of Shamiya. In the Shamiya-Kufa district the flooding and silting caused by the diversion of the Euphrates waters into several branches and numerous canals has raised the river and canal beds above those of the downstream region of Shinafiyah where the waters are once more united in a single channel. During the dry season the remaining water, confined to a narrow channel, rapidly erodes the accumulated alluvium causing a series of falls which move up the canals and tend to lower them to a level where they can no longer be used for irrigation. Regulators to stop this erosive action have been installed on two of the principal canals, but more are needed.

A somewhat similar problem is encountered farther down the river in the rice-growing region above Lake Hammar. Here ero-

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sion keeps the river bed so low in relation to the silted rice lands that the distribution of water in the dry season has become very difficult. The Development Board has provided ID 1,000,000 in its program for necessary control structures on this part of the Euphrates. There has been no agreement as yet, however, on a plan for these works.

Expansion of Irrigation—the Tigris and its Tributaries

Along the Tigris and the Diyala, pump irrigation is much more prominent than along the Euphrates. A large part of the country's irrigation pumps are concentrated on the stretch of the Tigris between Baghdad and Kut.[6] The principal flow-irrigation areas are in the Diyala River and, farther south, along the Shatt al Gharraf. Both these areas suffer from an acute shortage of water. In the North there is a small flow-irrigated area known as Hawija and near Kut an area of similar size fed by the Dujaila canal.

The Derbend-i-Khan dam will not make possible any expansion of the area under irrigation. However, by assuring a usable flow of 80 cumecs, as compared with a present mean flow of only 38 cumecs, it will provide a really adequate water supply over the entire area covered by existing irrigation systems in the Diyala Valley.

The Dokan dam will supply enough water to irrigate about 2.5 million masharas gross. In general accordance with the Haigh Commission's recommendations and the contemplated program of the Development Board, the Mission believes that this water should be used to irrigate new areas on the left bank of the Tigris, both above and below Baghdad, as well as additional areas in the Diyala River Valley. For this purpose, that part of the water supply not used for the irrigation of areas along the Lesser Zab River should be diverted through a new feeder into the Adhaim River; this in turn would be linked by a new feeder to the Diyala River. The latter would then supply the new Nahrwan canal which would be constructed to serve a large area on the left bank of the Tigris below the confluence of the Diyala. The Adhaim feeder should allow for a flow of about 76 cumecs and the Diyala feeder for about 41 cumecs.

[6] For a tabulation of the irrigation pumps in Iraq, see Table II in the appendix.

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312 Irrigation projects for the following areas would then be necessary:

1. Along the Lesser Zab the Makhmur area on the right bank (400,000 masharas gross) and the Hawija area on the left bank (300,000 masharas gross). About 180,000 masharas in the Hawija project are already being irrigated, and work is proceeding on the extension of irrigation to the balance. Both areas would be served by canals governed by a new barrage (Hawija barrage) on the Lesser Zab River which would also control the intake into the Adhaim feeder.
2. On the left bank of the Adhaim River a gross area of 600,000 masharas. To raise the water level for the necessary new canals, as well as for the Diyala feeder, construction of a barrage across the Adhaim will be necessary.
3. Extension of the irrigation system of the Diyala by 540,000 masharas gross.
4. Irrigation of a gross area of 660,000 masharas on the left bank of the Tigris below the Diyala River through construction of the Nahrwan canal and of a regulating barrage just above Beni Saad to govern the take-off of the canal from the Diyala.

This program differs from that recommended by the Haigh Commission in that it does not provide for the irrigation (1) of a gross area of 560,000 masharas on the left bank of the Tigris below Fatha, and (2) of a gross area of 300,000 on the right bank of the Adhaim. The agricultural potentialities of these areas have not been surveyed. A decision to provide irrigation for them should accordingly not be made until it is established that their agricultural value is at least equal to that of the other areas.

[653] In its five-year program the Development Board has already included part of the works for the above projects. This program budgets ID 500,000 for the Hawija barrage on the Lesser Zab, ID 300,000 for the barrage on the Adhaim, ID 500,000 for the Beni Saad dam, ID 750,000 for the construction of part of the new Nahrwan canal and ID 2,600,000 for canal systems in the areas commanded by the Hawija and Adhaim barrages. On the other hand, no provision has yet been made for the Adhaim and Diyala feeders.

The Mission has not attempted to determine which new areas might be irrigated with the additional flow made available upon

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completion of the Bekhme dam. As already indicated, the ultimate choice will depend on whether or not the Wadi Tharthar reservoir will store sufficient water for use in irrigation. 312

Other Irrigation Works on the Tigris

Other works are required, particularly to insure more effective utilization of the available water supply. One of the more important problems along the lower Tigris is how to prevent the wastage of water which is sent through Shatt al Gharraf from the Tigris. The Shatt al Gharraf, a former branch of the Tigris, has been converted into a canal through construction of an intake works which in turn is governed by the barrage across the Tigris at Kut. For a distance of 150 kilometers, however, it has no regulators of any kind. This makes it necessary to send through the intake a flow about double what would otherwise be needed and causes a great loss of water at the tail end of the canal. The gross area irrigated from the Shatt al Gharraf is theoretically 2,350,000 masharas of which 1,950,000 are irrigated by flow and 400,000 by pumping. Actually, however, the area in winter crops is apparently only about 700,000 masharas which indicates an intensity of irrigation of only 35 percent as compared with the customary 50 percent. Chronic difficulties are therefore experienced in supplying the requisite volume of water. In order to insure the required supply even for the 700,000 masharas in winter crops it is often necessary in the dry season to close the gates of the Kut barrage for some time, thereby depriving the lower reaches of the Tigris of water and interrupting navigation. The installation of regulators at suitable intervals will make it possible to irrigate the same area with a much smaller volume of water.

The Haigh Commission contemplated the construction of one regulator on the Gharraf, but only for the purpose of governing a new canal which would extend the area under irrigation. The Development Board has set aside ID 450,000 for "construction of regulators on the Gharraf and reclamation of new regions". The Mission urges that the regulators be constructed as rapidly as possible, but suggests caution in undertaking any new reclamation until there is ample assurance that the existing area can be adequately irrigated. Ultimately, of course, expansion of the area

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312 under irrigation may become possible when additional water becomes available either from the Bekhme dam or the Wadi Tharthar reservoir.

Another important project which should be undertaken is the better control of the lower Tigris in the vicinity of Amara. For a considerable distance above Amara and in the immediate neighborhood of that city, the Tigris is progressively impoverished by a series of outlets which can hardly be called canals but which, owing to inadequate control, divert a large portion of the river waters into the marshes. One of the largest of these outlets is the Musandaq on the right bank of the river. This outlet takes off the flood waters of the Tigris up to a maximum capacity of 2,000 cumecs and is normally sealed off in the dry season by a dike. After breaching by a flood, however, the dike cannot be rebuilt except at a time of low water long after the flood peak has subsided. In the intervening period much valuable water is lost. Near Amara the Buteira, Mushara and Kahala canals, with capacities of 1,000, 100 and 450 cumecs, respectively, further deplete the water supply in the Tigris. Farther downstream still more canals, of which the principal ones are the Tabar, the Majar el Kebir and the Michiriyah, deprive the Tigris of water. While all these outlets or canals benefit rice cultivation, they also submerge much land suitable for cultivation of other crops and result in immense losses of water. It is therefore necessary to devise a control program which will prevent the flooding of cultivable land, drain and make available for cultivation the extensive marshes on both banks of the Tigris below Amara, and keep enough water in the Tigris to maintain navigation. The Haigh Commission gave a brief study to such a program, the cost of which is estimated at about ID 3,000,000; and the Development Board has set aside ID 1,2000,000 for the "construction of regulators on the Tigris at Amara".

The Mission urges that, as a first step, all the canals branching off the Tigris be equipped with effective intake regulators which would make it possible to control water diversion. First of all, the Musandaq should be provided with such a regulator and the temporary wooden regulator of the Buteira should be replaced. An intake regulator should also be constructed for the Mushara. In addition, dredging of the Tigris might be undertaken in an effort

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to keep the river bed deep enough to prevent the formation of additional outlets at flood times. These measures should then be complemented by a series of small works to provide proper control of the canals themselves. The Mission suggests that no regulator barrages be built across the Tigris itself until the results of these control measures are known. Meanwhile, the program should improve the navigability of the river and assist in draining the marshes.

As in the case of the Shamiya district on the Euphrates, the program for controlling the lower reaches of the Tigris will make adjustments necessary in the rice-growing areas of Amara. Here, too, it is therefore important that the Department of Agriculture provide timely assistance and advice to cultivators in adapting to the new water regime.

III. Drainage

While new irrigation schemes always appeal to the popular imagination, it would be exceedingly unfortunate if they should continue to be carried out, as in the past, to the neglect of essential drainage. Lack of drainage facilities has resulted in progressive salination and deterioration of the soil. In such areas as Hawija and Dujaila salt has become a serious problem within only a few years from the time irrigation was begun. Almost all land irrigated by flow has become salty to some degree, resulting in declining crop yields. The only conspicuous exception is the land in the Diyala River Valley for which the river, which has cut a deep bed from the Jebel Hamrin range to its confluence with the Tigris, acts as a natural drain during the dry season. Pump-irrigated lands generally suffer less from salting, partly because they are higher and thus tend to have better natural drainage and partly because, owing to the cost of pumping, there is an incentive to avoid the lavish use of water which tends to waterlog the soil.

The Haigh Commission estimated that about 60 percent of the irrigated areas have been affected by salt. The Mission's own observations indicated that perhaps 20 to 30 percent of the cultivated land in the irrigated areas has been abandoned during recent decades owing to the accumulation of salt and that yields on the

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312 134 land still being tilled may have declined by 20 to 50 percent. The situation appears to be worst in the regions fed by canals controlled by the Hindiya barrage on the Euphrates. Thus about half of the lands irrigated by the Beni Hassan canal and 40 percent of those served by the Kifl canal have become too salty for winter cultivation.

The waters of the Tigris and Euphrates do not themselves contain excessive quantities of salt. Water is generally regarded as perfectly suitable for irrigation as long as the proportion of dissolved salts by weight does not exceed 70 parts in 100,000. Available analyses of the Tigris at Baghdad indicate that the proportion does not exceed 30 to 33 per 100,000 at most. For the upper reaches of the Euphrates the proportion is the same or even less, but in the lower Euphrates, which receives the drainage waters from the irrigated areas, the proportion may go as high as 90 parts per 100,000 in the fall of the year. (See Table III in the appendix.)

Salt has, however, become concentrated in the subsoil waters. The presence of some of the salt may be due to the fact that much of the land was originally under the sea. In the long run, however, it has been the continuous irrigation or flooding of the soil, combined with the effect of evaporation under the hot summer sun, which has led to a progressively greater concentration. Irrigation and flooding keep the water table high with the result that capillary action brings the water up into a zone where it evaporates under the heat of the sun and precipitates salt. Frequently cultivators resort to lavish use of irrigation water in order to wash the salt away from the roots of the crops. In the end, however, this practice has only worsened the situation by tending to raise the water table still further.

Salt accumulation can be prevented and existing salt evacuated only by digging drainage canals which will lower the water table to a level of 1.5 to 2 meters below the surface where capillary action can no longer be dangerous. Under such conditions water used in irrigation will wash away the salt deposited in the root zone and return it to the subsoil water which will be tapped by the drainage canals. Fortunately the salt found in the soil is not the sodium carbonate or "black alkali" type which cannot readily be washed away by water. Owing to the low level of the land the

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salty water accumulating in the drainage canals will in most cases have to be evacuated by pumps.

Up to the present, drainage has been the subject of little planning or experimentation in Iraq. Mr. J. S. Turcan, the drainage expert of the Haigh Commission, carried out a drainage study for the Aggar Qub region, which is irrigated by the Saglawiyah and Abu Ghuraib canals. It was found that of the total area of 320,000 masharas, 197,000 needed drainage. Experiments indicated that a flow of 1.0 cumec per 1,200 marsharas over a period of two and a half months rid the soil of salt to a depth of two meters provided drains were installed with a maximum spacing of two kilometers and sufficient depth to keep the water table from rising to a level higher than 1.75 meters from the surface of the soil. The cost of a drainage project for this region, inclusive of the cost of a pumping station to evacuate the drainage waters to the Tigris, was estimated at ID 279,000 per 150,000 masharas or ID 1.86 per mashara. Preliminary plans have also been made for the drainage of other areas. One of these was for the area served by the Beni Hassan canal where the drainage of 330,000 masharas was estimated to cost ID 750,000 or ID 2.26 per mashara. The Haigh Commission came to the conclusion that the cost of drainage would average ID 2.0 per mashara or a total of ID 8,160,000 for 60 percent of the area now under flow irrigation.

Drainage might be usefully complemented by steps to line canals at points where there appear to be excessive losses of water through seepage. Such losses may lead to waterlogging of the soil and a resulting rise in the water table. Since Iraq is rich in asphalt, a lining of bituminous concrete might be best.

Deterioriation of land through salting has become such a serious problem that immediate steps should be taken to initiate drainage on a large scale. The Mission urges that work on the main drains be begun as soon as plans can be completed. At the same time complete drainage systems should be laid out and constructed for areas where the salt problem is most acute, notably those irrigated by the canals dependent on the Hindiya barrage. A start might be made with a drainage system for the Aggar Qub region since it has already been carefully studied. Early steps should also be taken to drain the Hawija and Dujaila areas. The

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312 134 experience gained with the drainage systems first completed, particularly with respect to the depth and spacing of secondary drains, will be useful in planning subsequent schemes.

It is important also that drainage facilities be incorporated in any new irrigation schemes. It is always more costly to provide a drainage network for an already existing irrigation system, since it generally involves cutting across irrigation works and splitting up parcels of land. The installation of drainage facilities will be of vital importance for the rice-growing region of Kufa-Shamiya which the Mission recommends converting to a controlled flow-irrigated area. The same is true of the marshy region along the lower Tigris for which the Mission has suggested a number of control works.

The Development Board has allocated ID 2,000,000 to drainage in its five-year program. The Mission recommends, however, that at least ID 7,000,000 be devoted to this purpose over the next five years. Drainage works for the new irrigation projects alone would cost ID 5,600,000 on the assumption that about 60 percent of the area involved would require drainage. The Mission suggests that part of the cost of installing drainage facilities in existing irrigated areas be paid by the landholders who are benefited. This would be an equitable arrangement and need not be unduly burdensome if payments are spread over a number of years. Landowners, however, should not be given the option of participating in a drainage scheme, for the construction of an integrated drainage network requires the inclusion of all the land within a given area.

IV. Operation and Maintenance

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With attention focussed on the construction of reservoirs and new irrigation systems, there is a great danger that maintenance of existing irrigation works will continue to be neglected as in the past. There are many signs of such neglect today. Regulators have fallen into disrepair; canals have become silted and have developed bad leaks. False economies in the original construction and the use of poor materials have often made the task of maintenance more difficult. Thus frequently there has been no provision for roads

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along the banks of main and secondary canals although roads greatly facilitate inspection and maintenance. The facing of the canals adjoining the control structures is often too short for effective protection of both the canals and the control works. The turbulent water coming up against the earthen embankments may then undermine the embankments or even the control structures themselves. Brick, which lacks adequate resistance to shock and erosion, has sometimes been used as a construction material where concrete or precast concrete blocks would have been definitely preferable. In the future, it might also be desirable to try gabions of iron-wire net, weighted with stones and coarse gravel, in facing canals. These have given excellent and cheap protection against erosion in some countries.

Maintenance is also made more costly by failure to provide originally enough canal crossings for livestock and people, as well as places for washing and drinking. Under such conditions canal banks inevitably deteriorate with resulting leaks and the creation of pools of stagnant water. Crossings, which for the most part can be very simple in construction, should be installed near the villages and at points frequented by cattle. Paved fords will generally be best for cattle since they will provide facilities for drinking at the same time. There is also a need to regulate road crossings of small canals and ditches. Such crossings, which are built by the landowners, are often too short and constructed so poorly that considerable water escapes and the approaches to the crossings are reduced to quagmires.

The operation of the irrigation systems, involving the delivery of water to the actual users, could be considerably improved. Fair distribution is undoubtedly made difficult by chronic shortages of water. Whenever water is short, its distribution tends to be hotly disputed. Under such circumstances the influential landowner is often successful in bringing pressure to bear on the poorly-paid irrigation official who is in charge of distribution. Sometimes landowners resort to more direct action by building temporary dams across canals in order to divert more water to their land. Equitable distribution is also impeded by old water rights which are attached to individual land parcels, particularly in the Diyala River Valley, and are transferred with such property. They often confer a right

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312 to use a quantity of water out of proportion to the amount of land
423 to be irrigated; and in times of water scarcity they must be taken into account in rationing the available supply even though an objective appraisal of relative requirements might produce quite a different distribution.

312 A larger supply of water would, of course, minimize the difficulties of distribution set forth above, but in the long run it is also vitally important that economies be effected in the amount of water used. The provision of drainage facilities and the installation of an adequate amount of regulators on canals will certainly bring about substantial economies of this character. The cultivators in Iraq, however, have for many years been accustomed to use water rather lavishly; only demonstration will convince them that they
912 can safely manage with a smaller supply. It has already been
651 pointed out that the irrigation duty is very low compared to that in many other countries. For flow-irrigated lands it is about 16,950 masharas gross (equivalent to 7,200 masharas in crops); for land irrigated by pumps from canals, 19,500; and for that irrigated by pumps from rivers, 26,200. Pump-irrigated lands have a somewhat higher duty because they are generally better drained and therefore less salted and because the cost of pumping encourages economy in the use of water. As far as the Mission is aware, the problem of
312 raising the irrigation duty has not been systematically studied. The Mission recommends strongly that fields be set aside in each irrigation system for the purpose of determining through practical experimentation over a number of years the optimum quantity of water to be supplied to each crop. Such experiments should be carried out under the joint direction of the Agriculture and Irrigation Departments.

In the future it would be desirable to associate the landholders in each irrigation area as far as possible with the operation and maintenance of the irrigation system. Irrigation should be a truly
[476] cooperative venture. The Mission understands that councils of landowners already exist in some districts, notably along the Diyala, to assist irrigation officials in the distribution of water at times of shortage. Such councils might well be organized in all districts and with the broader function of advising on all problems of maintenance and distribution. They could sponsor the experi-

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ments in the best use of water mentioned earlier and could assist in disseminating the findings. They would be an important means of developing the concept of common responsibility for the efficient operation and upkeep of irrigation systems and might ultimately serve also to disseminate information on agriculture.

The legal situation with respect to water rights and the construction, maintenance and operation of irrigation and flood-control works is defined by Articles 1234 to 1238 of the Mejelle, or Ottoman Civil Code, and Law No. 23 of 1923 and its successive amendments. Repeated changes in this legislation have made it difficult to determine the validity of certain provisions. It would be desirable to codify and clarify the legislation and, in the course of such a review, to eliminate some of its defects. It would be advisable, for instance, to ensure a right of passage for canals across the property of third parties with compensation fixed by the Irrigation Department in accordance with defined criteria. At present such a right of passage is recognized but with the proviso that the interested party must buy or lease the necessary land, which, in practice, may lead to extortionate terms. There is also a need for a review of old water rights. While presumably such rights cannot be abolished, the right to use water might well be brought into closer accord with the amount of land to be irrigated.

The law makes the Directorate General for Irrigation in the Ministry of Communications and Public Works responsible for the construction, operation and maintenance of the irrigation and flood-control schemes. In 1949 the irrigation services had a staff of 1,330 persons, classified approximately as follows:

Engineers	26
Assistant engineers	20
Overseers	94
Office personnel	250
Bund personnel	820
Specialists	120

On the whole, there is an insufficient number of competent, experienced engineers; and pay scales are inadequate to retain able men in a service which often entails considerable hardship. The staff in the provinces is generally not large enough to cope with technical problems along with the many administrative questions

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centering particularly about the distribution of water. Young engineers are often sent as beginners to outlying posts where they work without adequate technical supervision. The service has lacked an experienced Chief Engineer who could, through frequent visits in the field, provide advice and guidance and support the staff with the weight of his authority. The Mission understands that such a Chief Engineer has now been appointed. It would be desirable to provide him with several experienced assistants specialized in drainage and irrigation questions.

In the past the planning of new works has been characterized by two defects: inadequate coordination with other government departments, particularly those dealing with agriculture and health, and failure to make full use of the knowledge and experience of the divisional irrigation engineers.

Although irrigation obviously serves agriculture, the Department of Agriculture in the Ministry of Economics has been virtually ignored in the planning of new irrigation schemes. The same has been true of the health service which is vitally interested in the layout of irrigation projects in connection with its fight against malaria and bilharzia. In its capacity as an over-all planning and coordinating agency the Development Board will be able to insist that all interested government departments be consulted in the planning of projects. A committee consisting of representatives of the Irrigation, Agriculture and Health Departments might be established to pass on irrigation and drainage projects and advise on their priority.

This committee might be complemented by a technical committee which would direct the experiments to ascertain the optimum use of water, to which reference has already been made, and perhaps to study other technical operating problems.

In the future planning of irrigation works it would be desirable to make greater use of the divisional irrigation engineers in the provinces. These officials have often acquired an experience and knowledge of local conditions which could greatly aid realistic planning.

The cost of new flood-control and irrigation works will in the future be defrayed out of the budget of the Development Board.

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The cost of operation, however, will have to be met out of the ordinary budget. In the past the ordinary budget of the Irrigation Department has been wholly inadequate to insure efficient operation and maintenance of the existing irrigation systems. In the last ten years an average of only ID 270,000 has been spent annually under the ordinary budget.[7] Expenses for operation and maintenance should actually be about 150 fils per gross mashara under flow irrigation. With a gross area of approximately 6,800,000 masharas under flow irrigation, the appropriate total would therefore be about ID 1,000,000 per year, inclusive of the salaries of the requisite personnel. The Mission therefore suggests that the budget of the Irrigation Department be progressively increased to reach that sum within the next five years, with the additional cost to be borne by the Development Board.

V. Costs of the Program

The Mission estimates that the total cost of the over-all program it has recommended would amount over the next five years (1952-53 to 1956-57) to about ID 55,000,000. Of this ID 27,600,000 would be for water reservoirs, ID 7,000,000 for drainage, ID 2,000,000 for improved maintenance and the balance for new irrigation works. A more detailed breakdown is given in Table V of the appendix. These estimates are exclusive of the provision made in the first year's budget of the Development Board. They are based upon cost estimates made in Iraq by the Haigh Commission and others, but make allowances of 10 to 20 percent for intervening price increases. A further rise in prices in the future would, of course, raise the aggregate cost.

[7] See Table IV in the appendix.

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APPENDIX

TABLE 1

Mean Monthly Discharges of the Euphrates and the Tigris

(In cubic meters per second)

Month	The Euphrates at Hit[1]			The Tigris at Baghdad[2]		
	Mean monthly discharge	Maximum monthly discharge	Minimum monthly discharge	Mean monthly discharge	Maximum monthly discharge	Minimum monthly discharge
January	592	1,130	258	947	1,926	432
February	665	1,217	278	1,388	3,020	323
March	968	2,651	344	1,992	3,496	797
April	1,853	2,917	462	2,951	4,541	935
May	2,235	3,358	533	2,775	5,241	997
June	1,208	1,792	249	1,684	3,562	548
July	577	809	268	897	2,069	292
August	358	533	202	504	1,278	192
September	293	383	183	373	827	163
October	311	557	225	359	872	175
November	432	881	247	516	1,105	212
December	558	1,248	264	709	1,413	300

[1] Based on observations over the years 1924-1946.
[2] Based on observations over the years 1906-1946.

TABLE II

Number and Horsepower of Irrigation Pumps as of March 1, 1950

Average capacity of pumps: 1948-49 = 36.22 H.P.
1949-50 = 36.40 H.P.

Liwas	Euphrates and canals		Tigris and tributaries		Diyala and tributaries		Shatt al Gharraf		Shatt al Arab		Total 1949-50		Total 1948-49	
	Number	H.P.	Number	H.P.	Number	H.P.	Number	H.P.	Number	H.P.	Number	H.P.	Number	H.P.
Mosul	—	—	74	2,394	—	—	—	—	—	—	74	2,394	71	2,209
Erbil	—	—	2	68	—	—	—	—	—	—	2	68	2	68
Suleimaniya	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Kirkuk	—	—	3	44	—	—	—	—	—	—	3	44	2	28
Diyala	—	—	54	2,518	68	3,277	—	—	—	—	122	5,795	115	5,386
Baghdad	139	4,453	1,084	33,475	92	3,852	—	—	—	—	1,315	41,780	1,313	41,849
Dulaim	265	7,904	—	—	—	—	—	—	—	—	265	7,904	268	7,974
Hilla	86	2,032	—	—	—	—	—	—	—	—	86	2,032	75	1,738
Kerbela	30	651	—	—	—	—	—	—	—	—	30	651	29	624
Diwaniya	570	22,610	—	—	—	—	—	—	—	—	570	22,610	477	18,705
Muntafiq	82	3,364	—	—	—	—	24	1,310	—	—	106	4,674	82	3,362
Kut	—	—	451	21,568	—	—	97	4,508	—	—	548	26,076	552	26,115
Amara	—	—	354	13,656	—	—	—	—	—	—	354	13,656	333	13,002
Basra	5	167	12	448	—	—	—	—	101	2,840	118	3,455	106	2,982
Total	1,177	41,181	2,034	74,171	160	7,129	121	5,818	101	2,840	3,593	131,139	3,425	124,042

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TABLE III

SALINITY OF THE EUPHRATES AND THE TIGRIS[1]

(proportion of dissolved salts in parts per 100,000)

Month	Tigris At		Euphrates At		
	Baghdad	Hindiya	Hilla	Samawah	Ur Junction
January	26	9.5	16.7	19.7	20.0
February	26	7.2	16.9	22.6	23.5
March	22	10.7	20.5	21.1	20.7
April	19	7.4	18.0	13.9	20.0
May	19	5.8	18.5	10.3	10.0
June	19	8.3	10.8	10.9	8.0
July	23	9.1	10.2	16.5	14.0
August	28	22.1	22.5	69.0	70.9
September	30	20.7	26.6	90.7	97.6
October	32	26.8	27.0	69.8	82.2
November	33	17.5	19.1	53.3	57.2
December	27	17.1	21.4	57.2	74.4

[1] Data for the Tigris are based on observations over the period 1924 to 1932, but those for the Euphrates on observations over only one year which was particularly dry.

TABLE IV

Expenditures of the Directorate General of Irrigation

(in dinars)

Fiscal Year	CAPITAL WORKS BUDGET			ORDINARY BUDGET				TOTAL BUDGET
	Capital Works Other than Bunds	Bunds	Total	Irrigation and Drainage	Flood Control	Salaries Allowances Services	Total	
1941-42	247,396	53,295	300,691	63,986	32,566	75,332	171,884	472,575
1942-43	200,328	119,047	319,375	67,971	36,512	95,128	199,611	518,986
1943-44	355,461	152,830	508,291	82,606	22,842	118,598	224,046	732,337
1944-45	448,309	157,986	606,295	74,963	23,266	154,693	252,922	859,217
1945-46	326,975	124,756	451,731	68,077	28,093	157,981	254,151	705,882
1946-47	667,057	337,897	1,004,954	89,965	125,208	201,527	416,700	1,421,654
1947-48	783,139	363,020	1,146,159	86,628	13,318	187,781	287,727	1,433,886
1948-49	1,088,591	230,671	1,319,262	70,765	54,213	206,146	331,124	1,650,386
1949-50	726,224	159,084	885,308	69,924	32,608	189,418	291,950	1,177,258
1950-51	607,481	173,080	780,561	56,926	19,877	193,868	270,671	1,051,232
Total	5,450,961	1,871,666	7,322,627	731,811	388,503	1,580,472	2,700,786	10,023,413

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TABLE V

Estimated Cost of the Program
(in million dinars)

Project	Development Board Program 1951-52 to 1955-56	Mission Program 1952-53 to 1956-57
I. Dams and reservoirs		
Wadi Tharthar	9.62	10.30
Dokan	2.32	2.80
Bekhme	—	7.80
Derbend-i-Khan	4.80	5.10
Habbaniya	2.12	1.56
II. Irrigation works		
On the Tigris and its tributaries		
Hawija barrage	.50	.60
Adhaim barrage	.30	.36
Adhaim and Diyala feeders	—	1.50
Beni Saad barrage	.50	.60
Irrigation systems using Dokan reservoir supply	2.60	5.41
Regulators on the Gharraf	.45	.45
Control of the lower Tigris	1.20	1.20
On the Euphrates		
Remodelling of Hilla canal	.90	.90
Kifl barrage, regulation of the Shamiya, and Shamiya-Diwaniya feeder	.25	1.40
Irrigation systems using Habbaniya water supply	.40	5.18
Regulation of tails of the Euphrates	1.00	1.00
Other irrigation works	.32	—
III. Drainage	2.00	7.00
IV. Improved maintenance and operation	—	2.00
Total	29.28	55.16

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ANNEX C

AGRICULTURE AND ANIMAL HUSBANDRY

I. Introduction

The main features of agriculture and animal husbandry in Iraq have already been set forth elsewhere and are only briefly recapitulated here.[1] Barley, wheat, rice, dates, other fruits and vegetables, and, more recently, cotton are the principal crops. Animal husbandry is of great importance but at present is really not integrated with agriculture. There is virtually no mixed farming. Crop and livestock yields are very low. Poor feeding is the principal cause of the low productivity of livestock. Low crop yields are attributable to poor drainage in the irrigation zone, to the failure to maintain soil fertility through the use of manure and fertilizer and the cultivation of soil-building crops, and to inadequate tools of production. Advances in agricultural techniques are seriously hampered by the poverty and ignorance of the fellahin who cultivate the soil and by the lack of interest displayed by most of the large landowners in improving agriculture. While there are extensive lands that can be put to the plow, particularly if more water is made available, a substantial portion of the land now in exploitation may be said to be overpopulated considering the present level of agricultural technique.

An increase in production is urgent. The standard of living which now prevails on the land is deplorably low. At the same time the population is increasing at a rate that can be expected to grow more rapid as public health improves. Output can be greatly increased both by extending the area under cultivation and by raising the productivity of land already being exploited. Primary emphasis has hitherto been placed on the first of these, and large new water storage and irrigation schemes are being planned.[2]

[1] See Annex A, *Basic Factors and Conditions.*
[2] See Annex B, *Flood Control, Irrigation and Drainage.*

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433 Undoubtedly this is important not simply as a means of raising production, but especially as a means of increasing the number of independent peasant proprietors, today so conspicuously few. In the future, however, more attention should be given to increasing productivity. It will take a long time to settle substantial numbers on new land. The living standard of the fellahin who will continue to work the land already in use can be improved only by a rise in productivity, unless there is a drastic redistribution of the output as between the landlord and the cultivator. Moreover, if output per man employed on the land cannot be raised, it may prove difficult to find the needed manpower to carry out the large development program for Iraq as a whole or even to settle newly opened lands without a significant curtailment of production in the existing agricultural areas.

000 This monograph is therefore chiefly concerned with measures to improve productivity. The first section discusses diversification of production, with emphasis on those crops which will bring animal husbandry into a more intimate relationship with agriculture. The second section deals with the possibilities of expanding the output of some of the crops already grown. The third section treats of some of the means by which productivity in general might be raised—better methods of cultivation and better tools, more effective control of pests and diseases and similar measures. In the next section the improvement of livestock and livestock products comes in for special attention. The succeeding section takes up the essential steps in a government program to improve agriculture and animal husbandry—the organization of an extension service, supported by adequate research and experimentation; the provision of more ample credit facilities; and the establishment of cooperatives. Following a brief discussion of forestry, the problems involved in the settlement of new land are examined, with special stress on the opportunities it offers to develop agriculture from the very beginning along more advanced lines. Finally, in the concluding section the organization of the government's agricultural services is considered.

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II. Diversification of Production

Fodder and Pasture

Existing crop rotation is far too limited and does not make effective use of the land. Wheat and barley are virtually the only winter crops. There are a considerable number of summer crops, but cotton and rice clearly predominate. Rice is really outside any crop rotation, since, for the most part, it is grown year after year on naturally inundated land. Fallow generally takes the place of good crop rotation. No doubt the large amount of water required for summer crops in relation to the available supply has hindered the introduction of new crops, but the water storage schemes that will be carried out over the next decade should bring a change in this respect. Moreover, economies in the use of water which may be effected may in the long run make more water available for summer cultivation.[3]

Basically the aim in the future must be to make fuller use of the land and the people who work it. The cultivator who grows wheat or barley in the winter does not have enough to occupy him except at sowing and harvest time and has still less to do in the summer. Conversely, the rice farmer has virtually nothing to do in the winter. On the average, cultivators keep little or no livestock outside of a draft animal or two and they grow no fodder and plant no pasture for their livestock. Hay-making is unknown. While in and around the towns grain, oil cake and cut legumes are used for feeding, in general the most important source of feed for sheep, goats, buffaloes and cattle alike are grain stubble and the uncultivated grasses and herbage. Thus the animals are left to forage for themselves. Under these conditions their food is adequate for only five to six months, barely sufficient for maintenance during three to four months and at starvation level for the remainder of the year.

Introduction of a mixed type of farming which will include leguminous fodder crops in the rotation with cash crops would mark a most important advance in Iraqi agriculture. Such crops will enrich the soil as well as provide feed for livestock. Better

[3] See Annex B, *Flood Control, Irrigation and Drainage*, pp. 208-09.

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241 feeding will make livestock far more productive and resistant to
231 disease and produce better and stronger draft animals. By making the keeping and systematic feeding of livestock an integral part of settled agriculture, the people on the land will be assured fuller employment and higher incomes. Livestock should play a more prominent part in the farm economy for still another reason. The great bulk of the sheep and goats, which constitute over 80 percent of the livestock, are the property of nomads and semi-nomads.
[221] Nomads from the northern and southern deserts regularly move into the riverine areas in search of summer pasture; and semi-nomadic shepherds move within the irrigated areas feeding their flocks on green barley, grain stubble and the grass and weeds of fallow land. Both are meeting with increased resistance from the settled farmers; and in any event the expansion of the area under irrigation will increasingly curtail the pasture available to the nomads. Thus the remaining nomadic tribes will need to be gradually settled, but they will adapt themselves readily to settled agriculture only if it will enable them also to maintain considerable livestock.

246 Among the forage crops berseem or Egyptian clover, a winter annual, is well-adapted to most of the irrigated area of Iraq and could be grown on a much larger scale. Sown in the grain stubble in late summer, it will provide a good pasture, soiling and hay crop. Alfalfa, a perennial, also makes a good forage crop capable of yielding 1.5 to 5 tons per donum for two to five years. However, in view of its deep roots, it cannot be recommended unless good cultivating equipment is available to kill it when necessary. For summer pasture, quick-growing crops such as millet or binder crops such as maize and sorghum should be grown. Summer legumes—cowpeas and mungo beans, and particularly the black mungo of India —can be recommended. The lack of water during the summer makes the problem of forage crops in the rain-fed zone more difficult. Large areas can, however, be planted to winter oats and vetch which, when cut cured and cocked, will provide a good reserve feed.

248 The increased production of cotton which has taken place recently should be an excellent source of livestock feed once farmers learn to appreciate the value of oil cake feeding. For this

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reason the cultivation of more cotton as well as such crops as linseed and sunflower seed will be important to the livestock economy.

Sugar Beets and Cane

The value of beet tops and pulp for livestock feeding might also be regarded as one of the principal reasons for introducing the cultivation of sugar beets. Similarly, one of the advantages of cane sugar might be the production of molasses which could also be used for livestock feed. These have been, of course, subordinate considerations in the minds of those who have advocated these crops for Iraq. The principal consideration has been to produce at home the sugar now imported in a volume which averaged 75,000 tons per year in the three-year period 1948 to 1950.

Undoubtedly sugar beets could be cultivated in the northern provinces of Suleimaniya and Mosul and sugar cane in the South, particularly in Amara. The real question is, however, whether either or both of these crops could be grown economically and on a scale large enough to warrant the necessary investment in processing plant. It must be decided whether cane or beet is preferable and whether either of them can compete with cotton for the available land, water and labor. The data available at present do not make it possible to arrive at sound decisions on these questions.

Test plots grown over 10 years indicate that there are several varieties of beet well adapted to Iraq and capable of reasonably high yields in terms of sugar. Experiments on cane sugar production at Abu Ghuraib, Basra and Amara have yielded much less favorable results, although one variety under test held some promise of furnishing sugar at an economic cost. The experiments, however, have not been conducted in a way and on a scale that would permit a satisfactory conclusion. If further experiments prove the feasibility of growing cane, it is likely to be a more economic crop than sugar beet. Experience elsewhere demonstrates that cane yields are generally higher and that the production of cane is less difficult and less demanding of skilled and semi-skilled labor than that of sugar beets. It is suggested therefore that further experiments on a larger scale be undertaken under appropriate expert guidance. In each of the possible beet sugar areas five or more 10-donum plantings might be tried. Special attention

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249 should be paid to the effect of fertilizers on yields and to the possibility of insect and disease damage. A careful record should be kept of production costs. Similar large scale experiments with sugar cane would have to be initiated at Amara on a comparable basis. A sugar beet expert should be engaged to direct research at Abu Ghuraib, with assistants at the Bakrajo and Nineveh substations. Another expert would be needed to take charge of the experimental work on cane. Both men would have to be given a sufficient field force to carry out the manual labor involved.

These field experiments should be supplemented by an economic inquiry into requirements for labor, farm equipment and transport and into comparative costs of production. In this connection the cost of producing cotton on the same land would have to be investigated. The value of the yield per donum, taking into account the by-products, would need to be compared on the basis of existing price relationships as well as the factors which may affect that relationship in the future. For example, it might be concluded that in the longer run the demand for cotton, and therefore its price, would be better maintained, especially in the sterling area. In any comparison of yields it would be necessary not only to consider the output per unit of area but also the area which an average family could be expected to cultivate in the particular crop. Thus it is probable that one family could grow a larger area in cotton than in sugar beets because the latter demand more labor, particularly heavy labor that could be performed only by adults. Finally, there must be a reasonable assurance that sugar can be produced and sold at a price which will prove competitive with that of imported sugar less the import duty.

III. Observations on Existing Crops

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No attempt is made in this monograph to comment on every crop grown in Iraq. Many crops could be improved through the introduction of varieties which are more productive and resistant to insects and disease. Only an adequate research and extension service, to which reference will be made later, will be able to capitalize on the many potentialities for improvement. Here, only a few of the more important crops are singled out for special mention.

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Dates

Dates, one of the principal foods of Iraq, are also a main export crop. While Iraq's pre-eminence in the world date market will not easily be threatened, the quality of dates has apparently declined and replacement of old trees has been far from adequate. Not more than 15 percent of the old gardens have under way a tree-planting program sufficient to replace old and deteriorating stands. More than 60 percent of the gardens are in poor condition owing to inadequate cultivation. Halfa, Johnson and Bermuda grasses have been allowed to become serious pests, causing considerable damage. Yields could be improved by better cultivation, manuring, fertilization, reduction of other fruit trees planted in date gardens and improvement in irrigation through the cleaning of canals and the installation of more pumps. Processing of the crop could also be improved, for old packing sheds where primitive methods of handling are employed are still in use.

Responsibility for promotion and improvement of the date industry is entrusted to the Date Association under a law approved in 1935. Ever since 1939 the Association has had a contract with the Andrew Weir Company whereby the latter undertakes to buy at fixed prices and export all the dates of the best varieties offered for sale from the Basra district. There is general agreement among the growers that this arrangement has helped to stabilize prices. On the expiration of the current contract with Andrew Weir after the 1952 season, the Association hopes to conclude a similar agreement with a newly-formed Iraqi company. The Association, the growers and the foreign companies engaged in the date trade are each expected to subscribe one third of this company's capital of ID 500,000. Consideration is also being given to extending its price-support operations to the dates grown in the Tigris-Euphrates valley. In addition, the Date Association is contemplating a distillery to convert into alcohol dates which are surplus to market needs.

There is considerable danger that in carrying out these ambitious plans the Association will neglect the need for better cultural practices stressed above. The Association has already been criticized for doing little to improve the production of dates. It would be unfortunate if it followed the precedent set by the Tobacco

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654 Monopoly which seems to have lost sight of one of its primary
245 objectives, namely, to raise the quality of tobacco. Moreover, before the Association and its Iraqi "marketing" company undertake the contemplated stabilization program, there must be reasonable assurance that prices are not fixed at excessively high levels owing to political pressures and that the company has ample financial resources. An operation of this character is likely to be highly speculative. While large profits may be earned in some years, severe losses will be incurred in others. With respect to the projected alcohol plant, caution should also be exercised. There is already one distillery making alcohol as well as arak. For the time being the demands for alcohol may make another plant appear attractive, but it is doubtful that in the long run dates can compete with other raw materials such as molasses as an economical source of alcohol.

Other Fruits

245 Iraq can grow a wide variety of fruits and nuts. Citrus fruit has been conspicuously successful in the Diyala River Valley and the number of plantings has increased greatly with the help of the Department of Agriculture which distributes the trees. A higher output could be achieved through the use of fertilizers, particularly nitrogen, and by better cultivation to discourage weeds and pests. Better storage facilities are also needed.

In some parts of the country, particularly in the North, conditions are quite favorable to the growing of deciduous fruits. The fruit, however, is poor in quality and seldom gets beyond local markets. The better grades of fruit are all imported from other Middle Eastern countries. Yet better care in pruning, cultivation, thinning and in the control of insects and diseases might well double the output of apricots, peaches and apples and greatly improve their quality. A rising standard of living should provide an incentive to higher production provided facilities are made available to can, dry and store the fruit. The proposed small-business section of the Industrial Bank might investigate the possibility of financing such facilities. The organization of transport to the market also requires attention.

Nut culture could also be expanded in the northern provinces. The possibility of top-working, budding or grafting improved

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varieties of pistachio scions on established native pistachio trees should be given particular attention. Almond orchards could be increased to advantage.

Vegetables and Potatoes

Vegetable culture is concentrated in the neighborhood of the large cities where such products as radishes, lettuce, cabbage, cucumbers, squash, tomatoes and others are in good supply during the season. Unfortunately vegetables do not figure prominently in the diet of most people. Outside of the big towns little or no vegetables are eaten. In part, this appears to be due to the fact that tribal tradition holds the cultivation of vegetables in low esteem. However, where the sharecropper is inclined to grow vegetables, he may be discouraged by the lack of available land or the shifting of the area assigned to him for cultivation. If a determined effort were made by the government to enlist the cooperation of the landowners, it might not be too difficult to overcome these obstacles.

It might be desirable to increase the production of potatoes which are now imported to the value of about ID 100,000 per year. The lighter soils along the large streams in the provinces of Mosul, Erbil and Suleimaniya are particularly well adapted to the production of both Irish and sweet potatoes. With proper guidance in cultural practices and the use of fertilizers, planters in these areas could easily supply the country's needs. If it is demonstrated that potato yields compare favorably with other crops, the government might well encourage the planting of potatoes both by launching an educational campaign and by furnishing the necessary seed to planters. Special attention will need to be given to transport, however, and the growers will have to be shown how to build inexpensive potato bins or pits with sufficient ventilation, insulation and accessibility.

Tobacco

Tobacco has been grown to some extent in the North for centuries, although it was not until the last few decades that its production assumed importance. Even now, the value of the tobacco crop is probably no more than a tenth of that of wheat or barley. In the mountainous areas of Erbil and Suleimaniya, however, it is

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the principal crop of the Kurdish farmers. Moreover, the way in which tobacco has been bought, sold and handled by the government Monopoly has created much controversy. At the same time the Monopoly's operations have yielded considerable profits to the Treasury. Finally, the government is hopeful of expanding the production of tobacco, which is at present grown only for home consumption, so that it will make a significant contribution to exports. For all these reasons tobacco has become an important and controversial subject.

The purchase and sale of raw tobacco and tombak was vested in the government by law No. 35 of 1939. This legislation also instituted government licensing of the manufacturing, importation, wholesaling and retailing of cigarettes and controls over the importation of cigarette paper, boxes and other requisites for the manufacture of cigarettes. Operation of the Monopoly was at first entrusted to the Customs Department but in 1943 it was transferred to a separate Directorate-General within the Ministry of Economics. The original law did not detail the objectives of the Monopoly beyond specifying that "one of its main objectives shall be the improvement of tobacco." Apparently, however, other objectives were (1) to assure the cultivators fixed and remunerative prices for their tobacco, and (2) to raise revenue for the government.

Quality of Tobacco

The principal objective of the Monopoly has certainly not been achieved. In fact, it is generally recognized that the quality of tobacco has deteriorated rather than improved during its existence. The reasons for this are many. First of all, neither the Monopoly nor the Department of Agriculture has given farmers any assistance in improving their crop even though the cultivation, picking and curing of tobacco require considerable knowledge and skill which has been largely lacking in Iraq. The tobacco now grown is a mixture of several varieties not at all uniform in type, time of maturity or quality. Instead of picking the leaves individually starting at the bottom of the stem, the whole plant is frequently harvested at once. Curing is haphazard, with immediate exposure of the leaves to the sun instead of retaining them in a wilting shed

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for three or four days. In packing and grading, growers do not separate the bottom, middle and top leaves or take care that packing takes place only when the moisture content and the pliability of the leaves are just right.

The second reason for the poor quality is inadequate grading and manipulation by the Monopoly. Tobacco is graded for the Monopoly by committees whose members are generally untrained. Classification is by color only and a bale given a single grade often has tobacco ranging through all shades of green, yellow and brown. Influential cultivators, or merchants acting on their behalf, can often obtain grades for their tobacco unwarranted by its merits. Thus the grading system offers little or no incentive to the grower to produce the best possible tobacco. Finally, the Monopoly stores tobacco under conditions which contribute to its rapid deterioration. Warehouses are often exposed to the elements and are without temperature and humidity control so that tobacco may alternately ferment and dry out. Little re-grading or manipulation is done in warehouses.

Farmer Income from Tobacco

Whether the Kurdish farmers have on the whole obtained an adequate income from tobacco is less easy to determine. Their income from tobacco has depended on (1) the amount of tobacco purchased from each year's crop by the Monopoly and the prices (less *istihlak* and land tax) paid, and (2) the amount of tobacco sold illicitly and the prices realized thereon. Unfortunately, not enough data are available to permit an estimate of the income of tobacco farmers. Data on prices paid by the Monopoly for the first three years of its operation are lacking; figures on total tobacco production, from which the amount marketed illicitly might be deduced, do not exist; and little or nothing is known about the prices realized on tobacco marketed illegally.

During the war the Monopoly, which was supposed to equate the supply of tobacco with demand by licensing the area under cultivation, apparently made no real effort to use licensing as an instrument for the restriction of production. The area licensed rose steadily from 28,014 donums in 1940 to a peak of 71,730 in 1944. In the period 1943-45 the income of farmers was also considerably

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increased by classifying a much larger proportion of their output as "extra" or "first" grades which, of course, fetched higher prices. At the same time the Monopoly boosted the prices paid for the 1944 crop to a level more than twice as high as those which had prevailed for the 1943 crop. For the 1945 crop it lowered its prices somewhat but still maintained them at a level approximately twice as high as in 1943. As a result the Kurdish farmers reaped a bonanza. Whereas the Monopoly paid only ID 634,005 for the 1943 crop, it disbursed ID 3,208,032 for the 1944 crop and ID 3,608,997 for the 1945 crop (see table).

TABLE 1

LICENSING AND PURCHASING OPERATIONS OF THE TOBACCO MONOPOLY

Year	Donums Licensed	Prices Paid for Each Grade (1943 = 100)				Total Purchases	
		Extra	First	Second	Third	Quantity (kg)	Value (dinars)
1943	57,747	100	100	100	100	4,080,787	634,005
1944	71,730	247	233	229	250	8,863,022	3,208,032
1945	34,797	210	198	194	211	12,582,734	3,608,997
1946	26,818	140	151	183	214	4,395,166	746,499
1947	19,225	154	167	202	236	4,231,320	757,152
1948	15,500	140	151	183	214	4,347,639	772,729
1949	15,500	140	151	183	214	6,621,905	1,326,291
1950	16,000	140	151	183	214	n.a.	n.a.

Beginning in 1946 the Monopoly began to retrench sharply. The area licensed was reduced successively to 19,225 donums in 1947 and 15,500 in 1948, and it has since been held to approximately this level. Prices were also lowered to some extent. Most important of all, a stricter grading policy was adopted, resulting since 1946 in the virtual elimination of purchases of the "extra" grade and substantial reduction in the proportion of "first" grade tobacco purchased. As a result the Monopoly's disbursements for purchases from the 1946 crop fell to only ID 746,499. They have since been maintained at approximately this annual level except for the amount paid for the 1949 crop which amounted to ID 1,326,291. The quantity purchased of each year's crop fell from a peak of 12,600,000 kilograms in 1945 to about 4,400,000 in 1946,

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4,200,000 in 1947, 4,300,000 in 1948, and rose again to 6,600,000 in 1949. Actually, the Monopoly by no means fully enforced its announced policy of buying no more than the maximum amount that the licensed area could ostensibly produce.[4] Its purchases exceeded the ostensible maximum by about 400,000 kilos for the 1947 crop, 1,200,000 for the 1948 crop and as much as 3,500,000 for the 1949 crop. Much of the 1946, 1947 and 1948 crops evidently found their way into the black market.

Because of the danger of growing stocks, the Director-General, supported by the Prime Minister, issued a warning in advance of the 1950 crop that in the future no more tobacco would be bought than could be produced on the licensed area. Evidently the Monopoly carried out this policy for, up to April 12, 1951, it had bought only 2,250,000 kilos from the 1950 crop out of a theoretical total of 3,200,000 kilos. Since the cultivators apparently did not take the government's declared intention seriously, the actual crop substantially exceeded the permissible total. However, farmers were apparently compelled to sell their surplus illicitly at very low prices, thus giving rise to an expectation that in the next years the limitation on production will be more generally observed. If so, it seems likely that farmers' receipts from tobacco will amount to between ID 600,000 and ID 700,000 per year at prevailing Monopoly prices.

In general, it can probably be said that farmers received more for their tobacco than they would have obtained in the absence of the Monopoly. Since the tobacco produced is generally poor and therefore is unable to find foreign outlets, it is likely that, in the absence of the Monopoly's price support and production control program, prices would have been substantially lower. At the same time, the farmers suffered from the rather erratic policies of the Monopoly which permitted them to realize very high incomes during some of the war years and let them down suddenly immediately after the war.

Tobacco Monopoly Revenues

The government has undoubtedly enjoyed considerable income from the Monopoly. In any discussion of this subject a distinction

[4] The Monopoly has operated on the assumption that each licensed donum would produce up to a maximum of 200 kg. of tobacco.

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651 655 must be made between (1) the actual cash income and cash expenditures of the Monopoly, which is of particular importance to the Treasury and (2) the Monopoly's accounting contribution to the budget. These two differ markedly, as is indicated below.

TABLE 2

CASH AND ACCOUNTING RETURNS OF THE TOBACCO MONOPOLY
(in dinars)

	Cash on Treasury Account			Contribution to the Budget
	Cash Income	Cash Expenditure	Balance	
Sept. 1, 1943-Mar. 31, 1946	6,760,878	5,692,965	+1,067,913	2,147,275
1946-47	3,518,655	3,807,628	−288,973	3,479,436
1947-48	3,580,232	1,340,388	+2,239,894	1,860,358
1948-49	3,061,214	844,814	+2,216,399	342,902
1949-50	2,240,234	1,036,028	+1,204,207	424,272
Total	19,161,213	12,721,773	+6,439,440	8,254,243

The accounting contribution to the budget is figured by (1) calculating the difference between cash income and cash expenditure realized by the Monopoly in its transactions in tobacco, tombak and cigarette paper, (2) adding or subtracting the net change in the value of the Monopoly's stocks during the year, and (3) adding sundry revenues from confiscated tobacco, license fees, storage, etc. Thus in 1946-47, the accounting contribution to the budget was large despite the cash deficit incurred by the Monopoly because stocks rose markedly. In 1948-49, on the other hand, the contribution to the budget was small in relation to the cash surplus of the Monopoly because stocks of tobacco and tombak during the year fell from 9,100,000 to 6,700,000 kilos. Finally, the contribution to the budget in 1949-50 was small because at the end of that year stocks were valued for the first time at purchase price instead of sales price as hitherto. As a result the valuation of stocks was substantially reduced despite the fact that the quantity of tobacco and tombak on hand had increased from 6,700,000 to 7,800,000 kilos.

By and large it certainly can be said that the Monopoly has yielded substantial revenues to the government. This revenue has

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accrued despite rather inefficient operation because the Monopoly has consistently charged tobacco manufacturers prices two to two and a half times higher than those it paid for tobacco and it has been able to compel them to accept tobacco at the grade which it has specified, despite the marked deterioration of such tobacco in the Monopoly's warehouses.

Recommendations

In the future the first concern should be improvement in the quality of tobacco. To accomplish this it would be desirable first of all to recruit abroad at least two or three experts on the growing of tobacco. These, assisted by a selected number of Iraqis, would work directly with the growers in a campaign to raise the standards of cultivation, picking and curing. In addition, a minimum of two leaf experts should be engaged to give instruction in the proper methods of grading or classifying tobacco. In order to provide a check on the work of the grading committees, the appointment of an expert buyer to approve all tobacco for final purchase by the Monopoly is recommended. He would presumably need to be a foreigner initially, but would have an Iraqi deputy who would be trained to take his place. In the warehouses, several experienced foremen-manipulators are needed to supervise and teach the staff correct methods of handling and storing the tobacco. The inadequate existing warehouses should be replaced with four to five new ones constructed of brick and concrete, equipped with dust extracting and humidifying plant and portable storage racks. Each of these new warehouses would have four floors, the first three devoted to storage and the fourth to manipulation.

The Monopoly itself might be retained, principally because there will need to be some agency to limit production as long as the tobacco is not of such quality that it can readily be sold abroad. Moreover, the large number of small tobacco growers might otherwise be at the mercy of the merchants and manufacturers who would have incomparably more bargaining power in the fixing of prices. It is suggested, however, that the Monopoly be reorganized into a financially autonomous agency with its own budget, its own accounts and its own funds. As an autonomous government enterprise it would be required to turn over annually to the Treasury

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its profits, less a suitable reserve, determined in accordance with approved accounting practice. An expert accountant should be engaged to draw up a proper system of accounting for the agency. In this connection it would be desirable to revalue the stocks of the Monopoly realistically after destroying inferior and excessively deteriorated tobaccos. The Monopoly would be headed, as at present, by a Director-General who might usefully be assisted by an adviser of recognized competence in the production and handling of tobacco. It would be desirable also to have an advisory board on which both manufacturers and growers could be represented.

The existing wide disparity between the buying and selling prices of the Monopoly provides a powerful incentive to illicit production and marketing of tobacco. The Mission strongly urges that this differential be greatly narrowed to a point where it is sufficient only to cover the expenditures of the Monopoly, plus a reasonable reserve. The revenue lost in this way could be collected in the form of additional excises on the manufacturers whose output and sales can be controlled relatively easily.

The present limitation on the amount of tobacco which the Monopoly will purchase from each licensed donum discourages productivity and should accordingly be lifted. This would not necessarily mean a further contraction of the licensed area, for the curtailment of black marketing resulting from the reduction of the difference between the Monopoly's buying and selling prices should enable the Monopoly to buy and sell more tobacco.

The Mission believes it would be very unwise to adopt current proposals to extend the Monopoly's operations to the manufacture of tobacco products. The remedy for the poor quality of tobacco does not lie in government assumption of manufacturing operations. The present manufacturers turn out a reasonably good product considering the quality of their materials. Their production costs are also likely to compare favorably with those that could be achieved with government operation.

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IV. Improved Methods of Cultivation 241

Dry-farming Techniques

Following this discussion of specific crops, it will be appropriate to give some attention to the various improvements in cultivation which might raise the yields of agriculture in general. Many of these improvements will be of special benefit to wheat and barley which will continue to be the principal crops.

One important method of increasing the productivity of the land—namely drainage—has already been discussed elsewhere.[5] It is worth emphasizing again, however, that the excessive use of water which aggravates salting should be discouraged as far as possible. Farmers in both the irrigation and the rain-fed zone must be taught how to make the most of the available water. For this reason the methods of dry-land farming which have proven successful elsewhere could usefully be applied in Iraq. These stress the need to prepare a proper seedbed that will insure seedlings a good start, to plant when moisture conditions are right and to sow during overcast weather if possible. Second, they include a number of practices to reduce evaporation—furrow irrigation instead of flood irrigation whenever practicable; subsoiling to break the soil pan and permit better percolation of water to a greater depth; and mulching as soon as possible after irrigation. Finally, they seek to increase the water-holding capacity of the soil through the addition of organic manure in the form of green crops; by thorough cultivation to improve tilth and by less frequent irrigation, but with greater amounts of water.

Fallow Practices

The existing fallow practices could also be considerably improved. Fallow as practiced in Iraq does tend to restore soil fertility to some extent and lowers the water table in the irrigation zone, thereby reducing the danger of salinity. Improved crop rotation (including especially the cultivation of soil-building crops), the use of fertilizer, drainage and more economical use of water will all in the long run reduce the need to keep land fallow.

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[5] See Annex B, *Flood Control, Irrigation and Drainage*, pp. 203-06.

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241 For a considerable time to come, however, it will be an important factor in agriculture. Proper fallow will promote nitrification and store in the soil up to 30 percent of the precipitation during the fallow period. This is true, however, only where the fallow land is kept free of vegetation which depletes the soil moisture and uses up the accumulated plant food. In Iraq this is seldom done, either because fallow is used as pasture or because the available tools [407] are not adapted to destroy the deep-rooted perennial weeds. The typical wooden "nail" plow, drawn by ill-fed and ill-kept animals, reduces the annual weeds but only encourages the more persistent, deeper-rooted species which subsequently offer stiff competition for crops following the fallow period.

In the rain-fed zone considerable land is tilled where the rainfall is marginal. The yield on such land is usually very poor. During a 10-year period, for instance, there will generally be five fallow years, two crop failures, two fair crops and one good crop. Better results might on the average be obtained if grain were planted every year on rows two and a half to three feet apart. This would reduce the plant population per unit of area and permit intertillage to control weeds and conserve moisture. Tests of this sort might well be made.

Use of Fertilizers

Although soils are generally fertile and have sufficient potash, phosphorus and nitrogen for crop production under the existing fallow system, experiments have indicated that applications of nitrogen increase yields under certain conditions. This is true of vegetables, of green gram following wheat and barley in the rotation, of cotton following small grain, of dates and citrus fruits and of rice produced in areas where silt does not replenish the soil. On the other hand, in Iraq the application of fertilizer to wheat and barley in the fall has failed to increase yields materially, and its application to small grain frequently promotes excessive vegetative growth. Presumably this lack of response is due to the fact that grain is grown on fallow land which has had a chance to replenish its supply of nitrogen. It is possible, however, that even on such land nitrogen may be deficient in the spring, making a top dressing at that time beneficial. Experience elsewhere has demonstrated that proper crop rotation and use of fertilizers make

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possible more intensive utilization of the land. Experiments conducted over a long period in the United States have shown the reaction of wheat yields to fallow, fertilizer and crop rotation. The results indicate that yields respond most favorably to fertilizers used in combination with a crop rotation scheme.[6] There is great need to do more experimental work in Iraq in order to determine the optimum rates of fertilizer applications for various crops, the best time of application and the effect of green manure on production.

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The high cost of fertilizers may have deterred their use. This handicap may be overcome if steps are taken to carry out the Mission's proposals to establish a large nitrogen plant at Kirkuk as well as a number of small bonemeal plants.

Tools and Draft Power

In discussing the need for weed control, reference has already been made to the lack of adequate equipment and good draft animals. In some parts of Iraq hand cultivation without the use of draft power may still be seen. In other parts, however, one can see the most modern tractors and combines at work in the fields.

Better tools and draft power will no doubt help to improve the productivity of the land both by destroying weeds and by better preparation of the soil. Similarly, better threshing equipment will raise the quality of the grain. This does not mean, however, that mechanization of agriculture will necessarily be the appropriate solution. Most farmers do not have sufficient land or money to warrant the purchase of a tractor or combine, and cooperative ownership will inevitably develop rather slowly. Moreover, under existing conditions the cost of amortization, operation and maintenance may be too high in relation to the cost of labor. Better plows drawn by sturdy animals may have largely the same effect as tractor-drawn plows in destroying weeds and improving prep-

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[6] Yields under various conditions were as follows in terms of bushels per acre:

1. Continuous wheat, without fertilizer	12.33
2. Continuous wheat, with fertilizer	23.58
3. Wheat after one year of fallow	22.00
4. Wheat in a 4-year rotation, without fertilizer	24.00
5. Wheat in a 4-year rotation, with fertilizer	32.00

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241 aration of the soil. Similarly, small stationary threshers may offer a better alternative than large harvesting combines to the present methods of threshing by flaying and the tramping of animals. The government should pay at least as much attention to the task of getting simple, inexpensive tools into the hands of the cultivators as to the much more ambitious program of agricultural mechanization. Good hand tools, for example, are almost nonexistent. Improvement in draft animals is also necessary. While the supply of draft animals cannot be increased rapidly, it is possible to get animals of greater strength and endurance by better feeding and selection.

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In the longer run, however, there is no doubt that mechanization of agriculture will assume growing importance. Physically, the country with its flat broad plains is ideally suited to mechanization although the canals and ditches in the irrigation zone offer some impediments to the use of machinery. Moreover, even now there are labor shortages at sowing and harvest times in some parts of the country, particularly in the North. In the future such shortages may become really acute as manpower is drawn from the land to take advantage of the new employment opportunities created by the over-all development program and as some of the fellahin working on land now under cultivation leave to settle new land. Under such circumstances mechanization may become the principal means of maintaining and expanding agricultural output. In its policy respecting mechanization the government will need to steer a careful course. On the one hand, it will want to keep some check on mechanization as long and wherever there is danger of displacing fellahin before alternative means of employment become available; on the other hand, it will find it desirable to accelerate mechanization whenever labor shortages become serious. Through its control over imports and credit, the government possesses effective methods of influencing the rate of mechanization.

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241 407 427 The United States Lend-Lease Program gave mechanization its first impetus. At present there are probably about 170 combines and 550 tractors in operation in the country, with about half of the number concentrated in the provinces of Mosul and Baghdad. In addition, 75 combines and 81 tractors are owned and made

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available for rental by the Agricultural Machinery Administration, an autonomous agency within the Ministry of Economics.[7]

Further progress will be seriously impeded, however, unless means are found to prolong the life of machinery which is now less than half what it is in the United States. The shortage of spare parts and repair facilities has been very discouraging to machinery owners. The failure of private dealers to provide these largely inspired the government's original decision to establish the Agricultural Machinery Administration as a monopoly for the importation and distribution of agricultural machinery. In accordance with suggestions made by an earlier International Bank Mission, the government has tried to meet the problem by different measures, namely by licensing dealers only on condition they agree to set up repair facilities and maintain an adequate stock of spare parts. The enforcement of these requirements, however, will not provide a complete solution, even if it is supplemented by completion of the AMA program for setting up its own repair facilities at Baghdad, Kirkuk, Mosul, Diwaniya and Kut. The AMA and private dealers should also cooperate in conducting courses in operation and elementary maintenance of machines for drivers. Moreover, simple local facilities to carry out all but major repairs are needed. An adequate number of mechanics both for the central and local repair shops must be trained, and for this purpose foreign shop supervisors and instructors will be necessary. The Industrial Bank may have to cooperate by providing small loans for equipping local shops.

The AMA now performs a number of useful functions. It regulates imports and the distribution of spare parts and tests different types of machinery for their adaptability to conditions in Iraq. Most important, it maintains a pool of machinery for rental. In some respects its operations could undoubtedly be improved.

[7] An official estimate given to the Mission gives a total of 320 combines and 750 tractors. Customs statistics for the years 1945 to 1950 inclusive, however, show that only 632 tractors and 262 combines were imported. Part of these are already out of commission. An on-the-spot survey in each province by a member of the Mission indicated that only 170 combines and 549 tractors, exclusive of government-owned machines, were in operation. Of the combines, Mosul had 75; Baghdad, 75; seven provinces, one to five each; and five provinces, none. Of the tractors, Baghdad had 250; Mosul, 150; Kut, 40; Kirkuk, 23; Erbil, 15; six provinces, less than 10 each; and three provinces, none.

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With a larger and more qualified staff it could do a better job in advising farmers on the type of machinery best suited to their needs and could undertake the tasks outlined in the preceding paragraph. It might also pay more attention to finding and testing the type of machinery that would be particularly useful on smaller holdings. Above all, in its rental service it should charge rates which will not cause it to run a large deficit or discourage private ownership of machinery.

The rental service itself performs a useful function and should be continued until private enterprise can provide the same service on the basis of a reasonable return or until sufficient cooperatives can be organized to provide machinery for their members. Many landowners cannot now afford to buy a machine, and others will not risk buying until they have had a chance to test its value by renting one. The AMA, however, now sustains heavy losses on its rental operation. For the calendar year 1951 its operating expenditures are expected to be ID 150,463 as compared with a projected rental income of only ID 50,000. For the two years 1950 and 1951, the total cash deficit of the Administration will probably amount to about ID 222,000.[8] It has been able to finance such deficits only by using up the balance of the capital contribution of ID 500,000 which the government originally made to the agency. Since ID 235,750 of this contribution consisted of machinery and buildings, very little of the remaining cash will have been left by the end of 1951. The AMA's financial situation is all the more acute because it now urgently needs funds to purchase new machinery and equipment at a rate of perhaps ID 250,000 per year. In the past there has been no depreciation reserve for the replacement of machinery. To meet this financial emergency it will be necessary to make the rental operation self-sustaining. In part this can be accomplished by reducing expenditures. Probably more important, however, will be an increase in rentals, especially those on tractors which are now relatively low. A continuing government contribution to the total budget of the AMA will probably be merited, but only to the approximate extent to which AMA expenditures are attributable to functions other than the rental of

[8] For the 1950 and 1951 budgets of the AMA, see Tables I and II in the appendix.

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machinery. At the same time the cost of new machinery and equipment will need to be financed—possibly out of Development Board funds if earlier plans to borrow for this purpose from the International Bank do not materialize.

Government rental of machinery should at best be considered a temporary expedient. It is wasteful, primarily because overhead expenses are high. The transportation of machinery from central shops to the renters tends to be expensive and to expose the machinery to excessive wear and tear. Private and cooperative ownership of machinery should therefore be encouraged. One step in this direction would be to enable the Agricultural Bank to lend money for this purpose on the security of the machinery. In the past the absence of any provision for registering title to such machinery has prevented such loans. Another important measure would be to encourage the establishment of cooperatives for the collective ownership of machinery, especially in the new agricultural areas which are to be opened. At present the producers' cooperative in the Dujaila project owns a number of tractors. Because overhead costs are relatively low it is able to rent them out at lower rate than the AMA while still apparently covering the cost of operation and depreciation.

V. Control of Pests and Diseases

Livestock Pests and Mortality

More effective control of pests and diseases would also materially help to improve yields. This is particularly true of livestock. Because of lack of funds, equipment and trained personnel, no systematic campaigns for eradicating specific groups of diseases have been undertaken. Many livestock diseases, particularly of the parasitic type, are rife. Among the principal livestock diseases are foot and mouth disease; haemorrhagic septicaemia; anthrax; sheep pox; blackleg; parasitic gastritis; tick-borne diseases (anaplasmosis and piroplasmosis); fowl cholera; Newcastle disease; various manges; and dourine. The available staff is wholly insufficient to control, let alone eradicate, any epidemic which might break out. A serious outbreak of disease would endanger the livestock industry of neighboring countries as well as that of Iraq.

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232 The first requisite for an effective campaign against livestock diseases is a larger trained staff. The number of field veterinarians should be increased from 17 to 28 as rapidly as possible. A number of Iraqis should be sent to foreign veterinary schools, preferably in countries where comparable livestock conditions exist, such as India, Pakistan, Egypt or Turkey. Pending the training of Iraqis, it would be advisable to engage a number of veterinarians abroad. The field service should be augmented by trained assistants and dispensers. Graduates of the Abu Ghuraib agricultural school might be recruited for these positions and given a short concentrated course in the practical aspects of veterinary science at the veterinary school at Baghdad, with further instruction at the neighboring clinic, the Veterinary Service Institute and the abattoir. It would be highly advisable to take some of the candidates for such training from the nomadic tribes so that they can later help their own tribes in combatting the hundred and one ailments which beset their livestock. Organization of a competent veterinary field service is likely to prove impossible, however, unless the prevailing pay and other conditions of service are greatly improved.

Secondly, facilities for diagnosis and treatment should be improved. It is suggested that simple regional diagnostic laboratories be set up in all provinces. At present all laboratory work in connection with diagnosis is centered in the Veterinary Service Institute at Baghdad, thus causing much waste of time and effort. Decentralization might begin with the establishment of laboratories in Mosul and Kirkuk to serve the North and in Basra to serve the South. Such regional laboratories should not be established, however, at the expense of the quality of the staff and service of the Institute in Baghdad. Complicated diagnosis would continue to be handled by the Institute which also manufactures sera and vaccines. It would be advisable to reorganize and strengthen the Institute so that it can give adequate support to the veterinarians in the field and make an appropriate contribution to veterinary education. The quality of equipment must be improved and production methods modernized. A qualified foreign expert might be appointed to assist in making the necessary changes.

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There is a great need for systematic remedial and prophylactic 232
treatment to reduce widely prevalent parasitic infections by such means as flock treatment against internal worms, and cattle and sheep dipping against external parasites. A small campaign to control sheep pox and other external ailments was begun at one time, but abandoned because of lack of funds. In the future adequate funds should be set aside to carry out a well-planned campaign of dipping, particularly in the North. This will involve the establishment of dip-tanks at strategic points in relation to the grazing grounds of the herds and flocks, the location to be worked out by a ground survey undertaken by field officers. Another important prophylactic measure would be the establishment of quarantine stations at points used for international trade in livestock.

At present many livestock belonging to the nomadic tribes die from lack of water or exposure to severe weather, either directly or indirectly as the result of lowered resistance to disease. In the severe winter of 1949 about 1,500,000 sheep are said to have died in the mountains of Kurdistan. In the South the waterholes used by the tribes tend to dry up in dry years, thus necessitating great treks to reach water during which many animals are lost. Such losses would be greatly reduced by livestock shelters in the North and more wells in the South. The shelters, which should be built at strategic points on the migration routes, would be primarily for the protection of lambing ewes and would provide emergency feed supplies for migratory flocks. A three-walled mud structure, with a roof and accommodations for shepherds and some feedstuffs, will be sufficient. Although the government has dug some wells for the use of the southern tribes, much more could be done.

Plant Diseases and Pests

The pests and diseases affecting crops have not been as great 242
a problem as those attacking livestock. The locust plague is a periodic menace, but has been kept rather successfully under control in recent years. The systematic distribution of poison bait in hatching areas during the spring has been the most effective method of combating the locust.[9] Since the bait will be scorned when succulent green food is available, it is important also that farmers

[9] The best bait consists of mill-run bran, sawdust, sodium fluorsilicate and water and should be applied at the rate of 14 pounds of wet bait per donum.

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242 be made to realize that the eggs can be destroyed before hatching by cultivating infested areas to a depth of about two inches either in late fall or early spring. Once the locusts or grasshoppers begin to spread, their ravages can be arrested by applying chlordane or toxaphene as spray or dust. Sprays have the advantage of causing higher initial kills and they continue to kill over longer periods than dust. To control future outbreaks the Department of Agriculture should at all times have access to sufficient funds and have on hand an adequate amount of supplies, vehicles, spraying and dusting equipment. This has not always been true in the past.

The most destructive of several sucking insects is the Sunn pest *(Burygaster integriceps)* which does great damage to wheat and barley crops in several Middle East countries. Iraq has reported losses of 30 to 50 percent and in some sections almost total crop losses. The most common procedure used in control of this insect has been to plant early-maturing varieties of grain, since the insect does not attack after the seed has begun to harden.

Grain losses from rust and smut are sometimes quite substantial and could undoubtedly be reduced. Although the Mission made only a superficial survey, loose smut of wheat and barley and close smut of barley were noted over a considerable area. In certain sections as much as 10 to 20 percent of the seeds appeared to be smutted. Leaf rust of wheat and leaf and stem rust of barley, as well as powdery mildew, were also observed.

Cotton pests and diseases are not at present a factor in production. The pink boll worm, however, has been recorded from Basra and the boll worm *(Earia insulana)* is found throughout the cotton-growing region. *Laphygma exigua* is most common and does some damage. There are also a number of other pests. While, in the aggregate, these have not inflicted serious losses, agricultural officers should be prepared to recognize any new infestations and should be briefed on the most effective methods of control. It might be noted in this connection that the State University of Arizona at Tucson, Arizona, U.S.A., has published in pamphlet form a schedule for cotton insect control that is outstandingly good.[10]

[10] *Cotton Insect Control*, Circular 179, Agricultural Extension Service, University of Arizona, Tucson.

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In any discussion of pests the damage caused by weeds is worth emphasizing again. Poor tillage and the tendency to use idle land as pasture has caused a rapid spread of Bermuda and Johnson grass in the irrigation zone. These pests have actually forced a considerable amount of crop land out of production and have lowered the yield of such summer crops as cotton, maize and sesame.

VI. Improvement in Livestock and Livestock Products

Improvement in both the quality and quantity of livestock production is likely to be of growing importance in the future, particularly since the anticipated rapid increase in public expenditures on development as a whole will create an expanding and more discriminating market for animal products.

In general the types of livestock found in Iraq represent rather hardy animals which, through a process of natural selection, have become fairly resistant to the rigors imposed by a severe climate and inadequate feed supplies. This does not mean that improvements in breeding cannot be effected. At present breeding is largely haphazard and uncontrolled, particularly as to timing and the selection of sires. It is a well-known scientific fact, however, that the evaluation of genetic factors influencing production in any direction—meat, milk, wool, work, and the like—cannot be properly assessed unless the nutritional level is first improved, thus permitting the full genetic development of the livestock to take place. Iraq is a particularly striking illustration of the truth of the old saying that "half the breed goes into the mouth."

One of the best methods of exploring the possibility of improved breeding and the results of better feeding and other livestock practices would be to establish a number of herds and flocks of indigenous breeds of livestock as well as poultry on government farms throughout Iraq. There careful records would be kept to discover for the first time what these animals can really produce with improved feeding, breeding and management. These livestock stations could also provide progeny-tested sires to farmers for

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breeding. Above all, farmers could be brought there to see with their own eyes the benefits of better livestock practices and the value of mixed farming. A start toward establishing such herds and flocks has already been made.

The following expanded program might be carried out over the next few years in different parts of Iraq:

Southern Area:

1. A flock of purebred Arabi sheep should be kept at the government farm at Basra, together with a herd of selected buffalo.
2. A herd of selected buffalo should be established at Amara either on government property or on private property where the owner will cooperate with the government in obtaining the necessary information on breeding, performance, feeding, etc.

Central Area:

1. At Abu Ghuraib Farm the selected flock of Awasi sheep should be more usefully adapted than at present to give information on breed performance, milk production, wool yield, etc. The herd of Jenubi dairy cows should follow a carefully planned program with respect to breeding, feeding and types of management to determine performance, influence of improved feeding, likely foundation dairy strains for country stations, and the like. At present the farm has no clearly defined livestock policy and lacks continuity of policy. This station might also usefully continue its work on Friesians as a town (Baghdad) cow, purely for urban milk supplies. It would be undesirable to continue with more than one imported breed of cows for this purpose, and the use of this breed should be strictly limited to urban requirements.
2. Work should also be done on buffalo in this central area but this can be readily carried out by controlling breeding and management on one or more of the buffalo settlements (e.g. Dora) in the neighborhood of Baghdad.
3. In the central area also, the work on Arab horse breeding should be maintained and expanded on a more realistic basis. The local racing organizations and the Turf Club would probably cooperate readily in a comprehensive breeding scheme to improve the quality of the local horses.
4. Finally, a small farm (300-500 donums) should be purchased in the Diyala province and organized on a mixed

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farming basis, including crops, horticulture and livestock [232] in its program. From the livestock point of view it should be a demonstration of the production of milk, eggs and poultry under irrigation conditions to meet urban requirements in the Baquba and Baghdad areas; a lesson in improved feeding, breeding and management, and, above all, in mixed farming.

Northern Area:

1. Flocks of Karadi sheep should be established at Nineveh and Bakrajo, a herd of northern black cattle at Bakrajo, and a herd of Sharabi cattle at Nineveh. Improved foundation stock or even purebred sires of the black mountain breed of cattle might be brought in from Turkey.
2. For mule breeding, selected foundation stock (jacks) might be introduced from Cyprus to meet the mountain and hill requirements of this northern area.

Special measures will need to be taken to assist the nomads in improving their livestock. Aside from the veterinary assistants which might be attached to the tribes, it would be desirable to train a few members of each tribe in such a way that they can give advice and assistance on other livestock matters, including the development of better breeds with the help of selected sires procured from the government. Better pasturage is, however, the critical question. In view of the difficulty of increasing the feed supply for the livestock of the nomads in the South, their problem may be best met in the end by converting an increasing number to mixed farming as new areas are irrigated. Some help may be given by investigating the possibility of conserving existing desert forage plants and introducing new drought-resistant grasses and herbs. For the northern nomads better watered natural grazing lands are available. Unfortunately these lands have been badly [233] abused, and, in the Northeast in particular, a considerable portion has been overgrazed so severely that scarcely any palatable forage remains. Regulations to enforce rotational grazing are urgently needed. Reseeding of the worst areas would not be impossible and would certainly reap large dividends. Controlled grazing is particularly necessary to safeguard the scanty forest areas. For this purpose it is suggested that the migration routes for livestock in the North be fixed in consultation with the Forestry Department.

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Quality of Livestock Products

237 Livestock products already play an important role in the economy. Demand for such products may well rise with the anticipated increase in the purchasing power of the population. With it will come an insistence on the improvement of quality which is now often very low. Better quality would also substantially raise the prices of export products.

Hides and Skins

281 Although there are a few modern plants, many tanneries are still extremely primitive and produce a poorly finished product. Their chief handicap, however, is the low quality of the hides they receive. Methods of flaying and preserving are generally poor. Even in the abattoirs which are supervised by the Veterinary Department the quality of the product leaves much to be desired. The prevailing methods of flaying—with the knife in the case of sheep and cattle, and with the axe in the case of buffalo—leave the hide lacerated, with hair, meat and blood adhering to the inside. Methods of preservation are also inadequate. Hides and skins collected outside of the abattoirs and many of those taken from the abattoirs are frequently improperly prepared to ensure keeping quality during storage and transportation until the time of their arrival at the tannery. The low-paid and poorly trained supervisors which the Veterinary Department assigns to the abattoirs are incapable of effecting any improvement.

In view of these conditions it would be advisable to appoint an experienced abattoir specialist to teach and direct the abattoir supervisors. The teaching could be done in the Veterinary School at Baghdad, with practical demonstrations at the Baghdad abattoir. Once an adequate number of supervisors are trained, the School might conduct simple courses for the abattoir workers themselves. This scheme of training could later be extended to village slaughterers.

The Hides and Skins Association established by a law enacted in 1951 affords another opportunity to raise the standards of the trade and industry. It is suggested that an experienced foreign expert be appointed to manage the Association in the initial period and establish its reputation as a constructive and modernizing

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influence. He would need to work in close cooperation with the proposed abattoir specialist. The Association should also investigate the possibility of using more local materials in the hides and skins industry. Thus local valonia or oak bark might be employed for tanning and locally refined and sulphurated fish oils used in the leather industry. Efforts might also be made to procure better salt at reasonable prices from the government salt works at Fao and to organize more adequate local supplies of date syrup which small tanneries use as a glucose.

Casings

Most if not all the casings are obtained from the abattoirs in barrels. Initial cleaning and grading is usually done on the floor which is occasionally washed down with water. The casings examined appeared to be remarkably free of parasitic infection, particularly in the North. More hygienic casings could be produced under more efficient and comfortable working conditions if the work were raised from the floor to zinc-lined tables and improved drainage and piped water supplies were provided in the sections dealing with casings.

Other Improvements in Abattoirs

Many abattoir buildings are in need of repair, enlargement and alteration. Improvements such as an impervious floor, better drainage and water supplies can often be effected at small cost. At present abattoir offal is largely wasted even though the amount involved would warrant the installation of modern methods of converting it into glue, bone meal, blood meal, etc. In order to encourage more slaughtering at the government-supervised abattoirs, it might also be desirable to review the taxes assessed at the abattoir which encourage livestock owners to resort to illicit slaughter.

Wool

The wool collected from the various fat-tailed varieties of sheep makes a good carpet wool and a valuable export product. Little attention is given, however, to good shearing, perhaps because milk rather than wool is considered the main product of the flocks. Shearing is done with crude hand shears. Wool is frequently left on the head and neck region and around the root of

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236 the tail, and in many cases not even all the "clippable" wool is taken from the body and legs. It is suggested, therefore, that one or more Australian wool clippers be recruited to teach several Iraqis, preferably shepherds, the proper way to secure a maximum clip. These trained clippers, who would be in government service, would then be assigned to clipping sheds which, with proper shearing equipment, should be established in one or two of the main sheep areas, starting, perhaps, with Samawa and Aqra. The tribes would be encouraged to bring their sheep to these sheds where they would be clipped for a small fee in cash or in kind. The sheds could at the same time be used as wool grading stations so that livestock owners could easily see which type of animals pays them best. They might also serve as centers for the collection of goat hair for export. In addition to the stationary clipping sheds, one mobile unit might be tried. The cost of these shearing units, which might be either hand or power driven, would be very small.

235 **Poultry and Eggs**

Poultry, which take a very secondary place in the livestock picture of the average village, are generally of nondescript breeds and feed themselves primarily through uncontrolled scavenging supplemented by an occasional handful of grain. No thought is given to breeding a better type bird or a bird which will produce larger eggs over a longer laying season. Yet the possibility of developing better and more productive poultry through proper feeding and management has already been demonstrated by work carried on by the government. In the future, poultry units should be established for demonstration and breeding purposes on all government agricultural stations. Experimental work on the control of parasites and on the construction of cheap poultry houses out of locally available materials should be carried on at Abu Ghuraib, Bakrajo and possibly Basra. Farmers should be asked to come and observe the results of good management and to draw better breeding stock from these agricultural stations. One or two of the larger farmers might be encouraged to undertake the raising of poultry on a large scale as an experiment. There will certainly be a growing domestic market for poultry and eggs, and it may ultimately be possible to cater to the markets of Gulf ports and the oil company settlements in the Middle East.

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Dairy Products

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The larger towns receive their milk and milk products from cows, buffalo, sheep and goats which are kept in backyards in town or on nearby farms and settlements. The dairy cattle among them are usually of mixed or nondescript breed. While they are surprisingly well fed, their housing and the methods of milking and processing the milk are extremely primitive. The majority of municipalities appear to have sufficient legislation to ensure clean milk production, but enforcement is poor and the livestock owner is not educated to the necessity for taking more care with the production of his commodity. Baghdad, for example, has regulations to remove livestock out of the city and locate them outside of the city boundaries. It has provided livestock settlements for the milking buffalo complete with walled paddocks, running water and feeding stalls, but unfortunately with no accommodation or living quarters for the workers. Despite these facilities many livestock owners continue to keep their animals in the poorer quarter of the city, and no attempt is made by the government to demonstrate clean milk production in these settlements.

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The government has taken a step in the right direction in installing a small milk pasteurizing plant in Baghdad (100-gallon flash pasteurizer), but the only milk passing through the plant is some 200-300 liters a day from the Abu Ghuraib agricultural station. Unfortunately many Baghdad residents do not even know of its existence. Some government officials have urged a larger pasteurizing plant even though the present plant is daily running considerably below capacity. The cleanliness of existing milk supplies must first be improved and producers persuaded to use the existing plant.

Another unfortunate feature of the present "backyard" herds is the fact that many dry cows and calves are sent to slaughter and only the milk producing animal is retained. Each year the dairy industry loses a great number of potentially good milk-producing animals in this way.

The following recommendations for the amelioration of the situation in Baghdad are put forward with the expectation that, if they are successfully applied there, they can be extended also to the other major cities:

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(a) A survey of all the milk-producing animals in Baghdad and environs should be undertaken through the Veterinary and Animal Husbandry Department. This should include the number of animals, names of owners and approximate production of milk; disposal of milk, either as fluid milk or processed; estimates of seasonal variations in production; some general information on sources of feeding stuffs; list of retail dairies and details of the disposal of their products.

(b) On the basis of the information thus obtained the government should take the lead in forming a cowkeepers association or milk producers association, which will represent the trade and deal with the government in all matters affecting milk supplies. The association should have a voice in advising the government on any regulation of the retail prices of dairy products.

(c) Through the Veterinary and Animal Husbandry Department the milk producer should be shown and persuaded to adopt better feeding, breeding and management methods.

(d) Existing legislation to move the livestock out of the heart of the city to settlements and nearby farms outside the city boundaries should be enforced. Regulations forbidding adulteration of milk must also be made effective, which will presumably necessitate more adequate remuneration of medical department inspectors to prevent bribery. Adequate laboratory facilities, together with the necessary trained staff, ought to be made available for testing inspection samples.

(e) On existing or newly established livestock settlements, adequate provision must be made for housing the workers, storing feeding stuffs, and purchasing day-to-day requirements. From visits to these settlements and discussions held with the producers, it appears that they would lend themselves admirably to the formation of producers' cooperative societies. The milk could be individually produced, taken to a central collecting station on the settlement and communally transported to town for either pasteurizing or direct processing and retail to the public. The cooperative could also provide the producers with cheaper feeds bought in bulk, dairy utensils and other provisions.

(f) The existing government pasteurizing plant might also be turned into a producers' cooperative. As a first step, a government board, including selected members of the private trade, might be appointed to supervise the plant. In

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the second stage it might then become a complete cooperative, with the government retaining representation on the board only to the extent that its agricultural station contributed milk for pasteurization. The cooperative would of course be subject to government inspection from time to time to ensure efficient and hygienic operation. 234

(g) The government should explore the possibility of purchasing selected young calves and dry cows from the producers, keeping them on a selected irrigated farm outside of town, and rearing and breeding from these stock for resale to the milk producers.

(h) Measures to eliminate disease among dairy cattle, including testing for tuberculosis and brucellosis, should be inaugurated.

(i) The government should send two of its trained staff from the Veterinary and Animal Husbandry Department to see and examine the Bombay Milk Scheme, Bombay, India, in order to assist in solving the similar problems which confront the Baghdad milk industry.

If the government is prepared to carry out such an over-all campaign to organize adequate and safe milk supplies for Baghdad and later for other major cities, there is little doubt that UNICEF and FAO will be prepared to assist with machinery and technical assistance, providing a fair proportion of the resulting supplies of pasteurized milk were reserved for those groups in the population who particularly need them (children, nursing and pregnant mothers).

VII. Education and Research

It will be readily apparent that a program for the improvement of agricultural and livestock production does not necessarily involve large government investments. Most of all, it requires a well-directed, adequately staffed government service that can effectively assist the cultivator and the livestock keeper. Within this service the primary emphasis in the future must be on a field organization equipped to work directly with the producer in improving his methods and management and supported by a properly focussed, practical research program. 242

Such a service is unfortunately conspicuously lacking in Iraq. Within the Department of Agriculture there are less than 25

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trained agriculturists.[11] In each province there is an agricultural staff of five to 20 men, but the officers are not qualified to direct research or extension work. The trained staff of the Veterinary Department is correspondingly restricted. It has already been mentioned that there are only 17 trained veterinarians in its field service. In 1950 the Agricultural and Veterinary Departments had only 108 and 40 officers respectively with a base pay of over ID 15 per month.[12]

The field services operate under great handicaps. The officers are underpaid and thus often supplement their income by engaging in other work or by extending special favors. Neither their pay nor their standing in the community is such as to attract promising talent. Transport or other equipment such as laboratory facilities is frequently lacking. Excessive centralization leaves little room for initiative. Even the taking of a field trip requires the consent of the central office. The staff is preoccupied with routine tasks, generally of a regulatory or control nature, to the virtual exclusion of real research or extension work. They grow and distribute seed and nursery stock, do some control work on pests and diseases, carry out inspections and collect rather inadequate information on production. Moreover, their work is rigidly compartmentalized. There is little or no contact between those dealing with livestock and those concerned with agronomy and no coordination between agriculture and irrigation.

Organization of an Extension Service

One of the principal tasks of the future should be to organize an extension or advisory service to farmers and livestock keepers. Such a service, adequately equipped with transport, would devote itself entirely to assisting the farmers and shepherds in the field. Its main emphasis would be on education through demonstration. For this purpose it would need to establish crop, livestock and

[11] These include in the Central Office at Baghdad, the director-general, two junior agricultural officers, one plant protection officer, one extension officer and one technical assistant; in the agricultural station at Abu Ghuraib, one senior livestock officer, two plant pathologists, one senior entomologist and four junior assistants; in the agricultural school at Abu Ghuraib, one director and two teachers; and in the horticultural station at Zafararia, one director, two assistants and two junior officers.

[12] With living allowances, this ranges from ID 23.750 to ID 26.750.

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poultry demonstration units in all parts of the country. Suggestions for such livestock units have already been made. In many cases it will not be necessary to establish government-owned farms, for it should be possible to stimulate the more enlightened landowners to lead the way in adopting better methods and permitting those in the neighborhood to come and see for themselves the results achieved. The ultimate goal should be to make some practical demonstration of the value of such improved methods accessible to nearly all cultivators. In addition the officers of the extension service would need to work intimately with the rural primary and secondary schools in a program to bring children a knowledge of the principles of good agriculture and animal husbandry as early as possible. They should also play a prominent role in any adult education programs launched by the Ministry of Education. For this purpose they should be equipped with visual teaching aids.

Obviously, such an extension service cannot be created overnight. The first step should be to appoint an expert who has had considerable experience in extension work abroad to recruit and train the necessary staff and take other preparatory measures. His initial staff might consist of an assistant responsible for collecting materials for use in the service and two or three supervisors to direct the gradually increasing amount of advisory work in the field. A few people should be sent abroad each year to gain practical experience of extension work. The supervisory personnel would initially have to be obtained abroad. Those officers who would work directly with farmers and livestock keepers in the field should not be highly specialized. Rather they need a good general training in agriculture and animal husbandry. In the past too much stress has been placed on specialization.

Many of the candidates for the extension service could be educated at the secondary agricultural school and the more advanced institute at Abu Ghuraib. The first of these now gives a three-year course to students who have completed three years of secondary schooling while the latter provides a two-year advanced course to graduates of secondary schools. The institute's course has recently been extended to three years and will soon be increased to a full four years leading to a bachelor's degree in agriculture. Both these schools should be in the position to train

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242 874 forward-looking men for actual farming as well as for posts in the agricultural administration and the extension and educational service. Unfortunately their teaching staff and curricula have been deficient in many respects. The teaching staffs should be strengthened by recruiting additional qualified teachers abroad and by using specialists engaged in agricultural research to teach their specialties. More practical agricultural work should be incorporated into the curriculum. Students in the institute, for instance, might be required to remain on the government farm at least one or two summers and complete a course in practical agriculture. This course would include the actual operation of farm machinery, the establishment of simple plots to demonstrate yield, crop adaptation and other agricultural techniques, and the care of livestock. It is important that students actually work with their hands during such a course, for there is no room in a field extension service for officers who consider manual work degrading. In addition to their regular instruction, both schools should be equipped to give brief courses from time to time in special subjects such as the operation and maintenance of machinery, animal husbandry, soil analysis, forestry, and techniques of extension work.

242 It will be some years before sufficient people can be recruited and trained for an adequate extension service. In the intervening period a complete separation between the extension service and the regulatory and inspection service cannot be carried out. Those newly trained would join the existing service and carry out both types of work, with the expectation, however, that growing emphasis would be placed on extension work. Consideration might be given, however, to establishing a full-time extension service as soon as possible within one or two areas limited to a few selected *qadhas*, so that different methods of working with farmers could be tested.

Ultimately it will be desirable to separate the extension service from the inspection and regulatory service. The latter might then be organized into two sections: one dealing with control of injurious pests and diseases, maintenance of standards for agricultural and livestock products, fertilizers and insecticides, and surveys of production and land use; the other concerned with the production, processing and distribution of pure agricultural seed

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and nursery stock. The first of these sections should have adequate laboratory facilities for identifying plants, insects and diseases and for analyzing chemicals, pesticides, fertilizers, feed and food products. The second section would need better equipment than is now available at Abu Ghuraib to test, clean and process seed. It would also require at least three nurseries—one each for the northern, central and southern parts of Iraq—to propagate needed fruit, nut and citrus stocks. Seed stocks of proven strains would have to be either imported or produced locally either on government farms or on private farms under contract. Experience indicates that soil and climatic conditions are favorable to the production of seed of the most important field crops, as well as alfalfa, berseem clover and many of the grasses.

The inspection and regulatory service in the field will presumably exist separately for agriculture and animal husbandry under the direction of the departments respectively responsible for these subjects at Baghdad. Ultimately, however, the extension service should be under the unified direction of a single director, particularly since it is so desirable in the future to integrate animal husbandry with agriculture.

Establishment of a Research Department

An extension service will need to be complemented by a staff engaged in practical research and experimental work and a small staff of agricultural statisticians and economists. The first will develop and test new and better strains of seeds and stock, experiment with different methods of soil cultivation and fertilization, explore means of improving livestock breeding and feeding, and the like in order to develop the most effective and best adapted agricultural and livestock practices for practical application through the extension service. The small staff of statisticians and economists will be concerned with developing a more accurate picture concerning farm and livestock production and land use. It will study marketing problems and provide advice on the pattern of agricultural and animal output that is likely to be most remunerative for the farmer in various sections of the country.

It is important that a Department of Research and Experimentation be established within the ministry charged with respon-

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sibility for agriculture. Such a department should gradually be staffed over the next five years with trained personnel able to devote full time to research and experimentation. At present those engaged in research are generally charged with other duties as well. Until more staff can be trained, the available personnel will presumably have to discharge several functions. It is strongly recommended, however, that immediate steps be taken to recruit a man with wide experience in research as the director of the new service. It would be his responsibility to coordinate such research as is now being carried on both in agriculture and animal husbandry and to build up a full-time staff. The research department should have ample facilities and therefore have jurisdiction over all experiment stations. Government farms are now primarily devoted to commercial production of seed and nursery stock rather than to research. In the future their principal task should be to serve as experimental and demonstration stations. Only such land as is surplus to these needs should be turned over to commercial seed or stock production. Under those circumstances part of the seed production may have to be contracted out or grown on newly established government farms.

The research department would concentrate on the following fields:

1. *Soil management and conservation.* This would include the initiation of a complete soil survey to determine the properties of different soils by field and laboratory studies, classify the soils by their properties and possible uses and summarize the information available on each type with respect to its tilth, fertility, adaptability to particular crops and the like. Such a survey would be extremely useful in planning land use, especially in the selection of land for irrigation and drainage projects. The first step would be to carry out a preliminary reconnaissance survey. The advantages of the intensive cropping system, involving proper crop rotation and the use of fertilizer, should also be studied in comparison with those of the crop-fallow system. Finally, the various methods of conserving moisture through better cultivation, timely destruction of weeds and the prevention of soil erosion could be tested.
2. *Introduction of new and better varieties of crops.* Among the subjects to be examined in this field would be the suitability of different types of forage crops, including

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grasses and legumes; new grain sorghum varieties and hybrid maize strains; and the adaptability of sugar beets and sugar cane.

3. *Horticulture.* This work, which should be centered at the Zafarania station, would cover vegetables, dates, nuts, citrus and other fruits. Tests should be carried out in the northern and southern as well as the central part of Iraq.
4. *Tools and machinery.* This type of work would test the suitability of various kinds of hand, animal-drawn and power tools for different conditions and jobs and especially seek to develop cheap but effective animal-drawn equipment and hand tools.
5. *Forestry.* Research on forestry should be developed with particular attention to experiments with controlled grazing on range and forest land and the selection and culture of trees suitable for various uses and sections of the country. It would be desirable to carry on this research not only at the forest nursery in Erbil, but also at the Abu Ghuraib and Bakrajo stations.
6. *Animal husbandry.* This would focus on the development of the most suitable pasture and feed crops and the best methods of preserving fodder for winter feeding. As already indicated, it would determine to what extent existing types of livestock could be improved by systematic breeding and feeding. The cost and results of feeding with different oilseed by-products and date by-products should be studied and a laboratory established to work on the relative value and digestibility of various feedstuffs. A research program on range development should also be carried out, but jointly with the forestry service. The government has already taken a constructive step by inaugurating a scheme near Chemchemal in the province of Kirkuk for experimenting with afforestation and rotational grazing. The site appears to be unsuited, however, for the production of low-priced fodder to aid in overwintering cattle. Experiments should also be conducted with the reseeding of pastures, using both foreign and indigenous grasses and clovers and with the possible use of fodder trees such as mesquites.

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VIII. Use of Incentives

Through practical and realistic experimentation and demonstration much progress can undoubtedly be made in persuading farmers and livestock keepers of the value of more modern methods. Throughout the world, however, the farmer and shepherd tend to be conservative. Even though he sees other methods yield good results on experimental farms or even on his neighbor's land, he may still be reluctant to try them himself, particularly if it involves him in higher initial costs. The government cannot, after all, prescribe what he should do, except perhaps on land which it allots for settlement. If it cannot persuade him, the government may find it necessary to give him some financial incentive to induce him to experiment with new crops or fertilizer. Thus it might make seeds or stock of new and improved varieties available free of charge or at nominal prices or subsidize the cultivation of forage or soil-building crops or the use of fertilizer. The use of such incentives to bring about the adoption of new crops or better methods of cultivation has on occasion proved effective in other countries. Experience also indicates, however, that great care must be taken to prevent them from becoming permanent.

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The problem of incentives is particularly acute because the prevailing sharecropping system appears to offer a special obstacle to the introduction of forage and soil-building crops. Although the landlord can in theory direct his fellah to grow any crop, the fellah will in practice resist the cultivation of any crop which involves curtailing other crops he can consume himself or sell for cash. Generally able to eke out only a bare subsistence, the fellah is not likely to have any interest in growing fodder for which there is no cash market, especially when he has little or no livestock of his own. Similarly he is likely to oppose cultivation of a leguminous crop for green manure, especially since he himself may not get back the same parcel for farming the following year. He might ultimately be persuaded of the advantages of a given four-year crop rotation, but only if he were assured tenure of the same land over a sufficiently long period. The ways and means of overcoming these difficulties inherent in the existing tenancy system should be

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carefully studied by the government. In this study the possibility of offering financial incentives directly to the fellah and of making certain changes in the conditions of tenancy would need to be explored.

IX. Agricultural Credit

If farmers are to purchase fertilizer, more livestock and better draft animals, tools and machinery, they will need access to credit facilities. The Agricultural Bank with a nominal capital of ID 1,000,000 does not at present adequately serve their needs. First of all, its resources have been insufficient. As of March 31, 1950, the latest date for which a balance sheet was made available to the Mission, the capital actually paid in amounted to only ID 500,000. Its lending resources were supplemented to some extent by time deposits totalling ID 136,996. Total loans outstanding aggregated only ID 556,609. Since that date a further capital contribution of ID 50,000 has been made to the Bank, its time deposits have increased somewhat and a loan of ID 150,000, repayable in three annual installments, was obtained from the National Bank in April 1951. A shortage of liquid resources compelled the Bank virtually to suspend lending in November 1949. Not until a year later was it possible to resume credit operations and then only on a modest scale. The Bank has never been able to meet the demand for credit. Although authorized to lend up to ID 3,000 to any individual for a maximum term of 10 years, in practice it has limited the size of its loans to ID 1,000 and the duration to five years.

It would be desirable to increase the capital of the Bank substantially—to a total of perhaps ID 2,000,000. The Development Board would seem to be the logical and probably the only available source of funds for this purpose. The Bank would then be able to repay its debt to the National Bank and still extend its loan operations substantially. At the same time, however, there should be a careful review of the Bank's lending policies to make sure they are sound. In the past there has been a tendency for its loans to become frozen. In the fiscal year 1949-50, for example, only ID 108,333 of the total amount of ID 279,975 in loans falling due was actually received. Maturities were postponed on loans totalling

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453 ID 50,507 and no arrangements for repayment had been made by the end of the year on loans amounting to ID 120,934. A sum of ID 53,303 was received on loans which had fallen due in 1948-49, but in that year the total loans for which due dates were postponed or for which no repayment arrangements were made aggregated ID 98,983. Although the Bank claims it will ultimately be able to collect on all its loans, there appears to be a need for much stricter and prompter collection and perhaps also for more careful scrutiny of loan applications to make sure that they are intended for productive purposes. The Bank must be quite free of any political pressures and capable of granting and collecting loans without fear or favor.

426 453 One of the most difficult problems is the provision of credit to the sharecropping fellah. Under present conditions he cannot get a loan from the Bank because he is unable to offer adequate security. The Bank generally makes loans only on the security of mortgages, although it can also accept as security tangible, nonperishable, movable property other than crops in the field or stored on the farm. To some extent it also grants loans on the guarantee of the government or on the joint guarantee of a number of recipients. Of the loans outstanding on March 31, 1950, ID 538,752 were secured by immovable property, ID 18,634 by joint guarantee and ID 9,601 by government guarantee. The fellah must turn to the landlord or some private moneylender for credit. Under the Law Governing the Rights and Duties of Cultivators enacted in 1933 any advances made by the landlord are in theory free of interest. Actually, however, the "advance" is generally in kind—i.e. in seed, draft animals, machinery, etc.—and the return to the landlord is in the form of a larger share of the crop which conceals a very heavy interest charge. One of the prime needs is to give the fellah access to better means of production and on much more reasonable terms. The organization of cooperatives among the fellahin would seem to be the best means of accomplishing this, since the Agricultural Bank is authorized to lend to cooperatives on the joint guarantee of its members.

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X. Cooperatives

Cooperatives have unfortunately made little progress. There is an impressive law on cooperatives which provides, among other things, for their registration and the auditing of their accounts by the government. The government also received an excellent report on cooperative possibilities made by an expert in 1947. Neither the law nor the report have really been implemented. Responsibility for cooperatives is now vested in a Department of Cooperatives within the Ministry of Economics. Its entire staff consists of one part-time director, another officer and a clerk. By May 1951 it had registered 40 cooperatives of which all but one were consumers' cooperatives. Apparently nearly all of these are either dormant or of small importance. The Department has obviously been unable to give constructive, practical assistance in the organization and operation of cooperatives or even to take the initial step of sending some people abroad for training in cooperative management. It has neither received nor audited the financial accounts of any of the existing cooperatives.

The only really worthwhile cooperative in existence appears to be the producers' cooperative in the Dujaila project where over 1,000 small-holders were settled at government expense. This cooperative, which was formed in 1947, owned in the spring of 1951 ten tractors with tillers, two trucks, a small flour mill and a clubhouse. The cooperative rents the tractors at a reasonable rate to its members and at a higher rate to nonmembers. Operation of the flour mill is contracted out under an arrangement which fixes the milling charges. The trucks provide transport for men and goods both within the settlement and to the nearby town of Kut. Although its accounts leave much to be desired, the cooperative appears to be in a sound financial condition. (See Note 13 on following page.) It needs expert advice, however, on the proper methods of setting up its books and controlling its expenditures, and its accounts should be subject periodically to an independent audit. A consumers' cooperative also operates in the Dujaila project, but it aparently runs at a loss owing to high selling expenses and low turnover. It would be advisable either to dis-

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474 continue it entirely or at least to replace its existing three shops with a mobile store which might sell more at lower cost in this scattered settlement.

The experience with the Dujaila producers' cooperative indicates that useful results can be obtained. Under existing conditions cooperatives will not, however, be organized spontaneously by the farmers themselves. They will need the impetus, assistance and supervision of the government. The cooperative is a rather advanced form of social organization and can therefore be expected to develop only at a slow rate. The necessary spirit of cooperation and sense of collective responsibility will have to be carefully nurtured in any program of adult education sponsored by the Ministry of Education and in any educational programs carried out by the proposed agricultural extension service.

The first step should be to transfer responsibility for cooperatives to the Department of Agriculture. It would be well to concentrate entirely on rural cooperatives for these are most urgently needed. The next step would be to recruit and train personnel. The staff need not be large initially, but should be sufficient to permit considerable field work. It should consist of people genuinely interested in cooperatives and preferably drawn from rural backgrounds. It must include one or two accountants equipped to draw up a standardized system of bookkeeping to be

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[18] The cooperative has not drawn up a balance sheet of its assets and liabilities. Nevertheless, it is possible to conclude from data made available by the Dujaila Committee in Baghdad that the cooperative has apparently not operated at a loss. From February 1, 1950 to April 20, 1951, its current revenues amounted to ID 6,024.991 and its current operating expenditures on salaries, wages fuel, and sundries to ID 3,955.695, so that the operating account showed a surplus of ID 2,069.296 which could be reinvested. A provisional balance sheet as of April 1951 could be struck about as follows:

Assets		Liabilities	
Property (at cost)	ID 14,055.734	Capital paid-in	ID 8,207.066
Accounts receivable	856.052	Debts owed	2,128.000
Cash (approximate)	260.000	Depreciation (balance)	4,836.720
Total	ID 15,171.786	Total	ID 15,171.786

The depreciation allowance made above represents the difference between the known assets and liabilities. This amount corresponds in fact closely to an allowance of around ID 5,000 which should be allowed on the basis of sound accounting practice to cover actual depreciation on the various items in the capital inventory (20 percent annually on tractors and lorries; 10 percent on mill equipment and buildings).

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followed by cooperatives and to audit the accounts of cooperatives. The necessary staff will have to be trained abroad, preferably in Cyprus where a diversified cooperative movement flourishes. It will also be desirable to give some instruction in cooperatives in the teachers' training colleges and the agricultural schools.

One of the logical places to start with the organization of cooperatives would be in new agricultural settlements as was done in fact in the Dujaila project. People who start afresh in a new settlement will generally be more receptive to new forms of organization. In these new settlements cooperative ownership of tools and machinery will probably be most important. Care must be taken not to overburden the cooperative with too many activities at the beginning. Operations should be expanded only as experience is acquired.

As already indicated, the need of the fellah who continues to farm on a sharecropping basis is the most urgent. He cannot therefore be neglected in the effort to establish cooperatives even though his poverty and his relations to his landlord may make the organization of cooperatives particularly difficult. Among those fellahin, one might begin with the organization of credit cooperatives which would make loans not on the security of the borrower's possessions but on his reputation for work, honesty and thrift. In this way the fellah might be able to obtain credit on more reasonable terms for the purchase of tools, seeds, animals and other requisites. Initially such credit cooperatives would probably need to be financed almost entirely by the Agricultural Bank, but the objective should be to base their operations increasingly on the regular savings of their members.

XI. Storage Facilities and Credit

Farmers are also in need of adequate facilities in which they can store their produce and obtain credit against warehouse receipts. At present, prices tend to dip sharply at harvest time because the farmer is generally compelled to sell his crop immediately after or even before harvest in order to obtain needed cash. The merchants with money then reap the benefit of subsequent price advances. More storage and credit facilities would enable

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the farmer to get a fairer share of the price and bring about greater price stability. Even if the merchants primarily used these facilities, the farmer would still benefit indirectly because more merchants would be financially able to compete for his products.

Grain stores are especially needed. Cotton can at present be stored at ginneries, and the Agricultural Bank is lending money on such cotton. Aside, however, from a 5,000 ton silo at Baghdad, which went into use with the 1951 harvest, the country possesses no modern grain storage facilities. The Grain Board which is charged with responsibility for storage projects is contemplating the construction of a 40,000 ton silo costing about ID 2,145,000 at Basra. This silo would primarily serve the export trade. It would be desirable to supplement these two with a number of smaller stores, less elaborately equipped and located nearer the centers of production. Such stores would afford necessary protection against grain pests and also help to mitigate the fear of famine which is ever present in a country with sharply fluctuating harvests. If equipped with simple cleaning plant they would help greatly to improve the quality of the grain. Grain thrashed by hand according to the prevailing custom contains from 15 to 40 percent foreign matter and from 5 to 15 percent dirt. The number, location and size could only be determined after a thorough survey. It is not unlikely, however, that from 12 to 18 such stores with an individual capacity ranging from 2,000 to 5,000 tons and a total capacity of about 75,000 tons would be needed. For the most part they will not have to be mechanized and can consist basically of simple steel or concrete sheds. The total cost would probably not exceed ID 750,000.

Two possible obstacles to the actual utilization of grain storage facilities should be considered. There may be a disinclination to use them for fear of giving the government knowledge of such stocks and thereby exposing them to taxation. Much grain now escapes taxation. To encourage people to take advantage of the stores it may therefore be necessary to reduce substantially or abolish the *istihlak* tax which is a type of sales or turnover tax. Other reasons for abolishing or reducing this tax have already been advanced elsewhere.[14] Another difficulty in the way of using such

[14] See the Mission's main report, p. 95.

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storage facilities lies in the wide variation in the quality of the grain. Those with better quality grain may refuse to store it except under conditions which will ensure that it will be kept as a separate parcel. While this may be possible in the smaller, non-mechanized sheds, it will be impossible in the silos at Baghdad or Basra. There, however, it will be desirable at least to have means for weighing each parcel of grain after as well as before cleaning. At present there are no such facilities in the Baghdad silo and none are apparently contemplated for the Basra silo. Under such conditions there will be a premium on the storage of grain with a large percentage of foreign matter. Those with relatively clean grain harvested by combines will, on the other hand, refuse to use the silos.

If credit is to be extended on grain stored in silos, there must be adequate supervision to insure the issuance of proper warehouse receipts and to prevent the release of any stored grain except against the surrender of such receipts. Presumably any new facilities would be owned and supervised by the Grain Board. This Board, however, would hardly be in the position to finance all the proposed additional facilities. In 1950 the International Bank was approached with respect to the financing of the Basra silo, but now that Iraq is assured ample sterling revenue from oil and only a small part of the necessary expenditures is likely to be in dollars, the government may consider it undesirable to contract a loan for this purpose. Financing by the Development Board would then appear to be the only alternative. The Grain Board might even have difficulty in financing the smaller storage facilities. Although its assets as of March 31, 1951, amounted to ID 1,123,969, over 30 percent or ID 321,113 consisted of "fixed assets" and another item of ID 687,222 designated as "sundry debtors" represented almost entirely a claim on the Treasury. Over a number of years the government has levied a one percent tax on grain for the benefit of the Board but it has retained the proceeds provisionally for its own needs. As long as the ordinary budget remains tight, as is likely over the next few years, the government may find it difficult to convert this claim into cash. Under such circumstances the Development Board may find it necessary to give financial assistance for the smaller projects.

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XII. Forestry

311 137 Anyone who contemplates the treeless plains and the barren mountains of Iraq is quickly persuaded of the need of afforestation. The forest area comprises only 25,500 square kilometers in the four northern provinces, and of this area only 17,000 square kilometers is covered by what may really be classified as forest. 33 The remainder is in forest pasture and sub-Alpine shrub. Yet forestry has received little attention. The only trained forester in Iraq is the foreign director of the Forestry Division which is subordinated to the Department of Agriculture. His staff is inadequate to provide proper protection of existing forests, let alone to undertake forest development. Only a small amount of afforestation, soil reclamation and propagation work is in progress. There is no modern forest law. Forests suffer severely from indiscriminate cutting for fuel and charcoal, overgrazing by livestock, shifting cultivation and fire. In the clearing of land for cultivation in the mountainous areas of the North, forest and pasture have been destroyed and land laid waste by erosion.

Afforestation is of vital importance not only to check erosion and help prevent floods but also ultimately to meet the acute shortage of timber for building and fuel. In the plains belts of trees are needed to serve as windbreaks. A detailed forestry program has already been set forth in a lengthy report by a British expert. The Mission can only urge that his recommendations be carried out.

The first step should be to build up an adequate forestry staff and to enact a satisfactory forest law. The Department of Forestry should be given a status equal to that of the present Department of Agriculture. Trained foresters will be required not only at headquarters and in the field but also at the forestry research stations at Abu Ghuraib, Bakrajo and Erbil. Initially some of the foresters, including the director, will have to be recruited abroad. A course in forestry might be given in the agricultural schools at Abu Ghuraib.

In the northern mountains the existing forest areas should be preserved primarily as a means of protecting the catchment of the Tigris and its principal tributaries. Controlled, rotational grazing will be necessary to protect these forests. To furnish a supply of

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timber, at least 5,000 square kilometers in the valleys of the main rivers in the north ought to be afforested by means of irrigated plantations of quick-growing species such as poplar, eucalyptus, tamarisk, ash, plane and shisham. Such forests should be able to furnish timber in growing amounts in 15 to 20 years.

It will be at least equally important, however, to plant trees in irrigated plains of central and southern Iraq. The ultimate goal should be to devote at least 10 percent of the irrigated areas to forestry in the form of farmers' woodlots, plantings along roads and canals, windbreaks and shelter belts. In the new settlement areas farmers might well be required to plant a specified area in trees. Measures such as these will make timber available in the immediate vicinity where it is sorely needed.

The Development Board has recognized the need for some additional expenditure on forestry by tentatively setting aside ID 250,000 for this purpose in its five-year program. It is urged that this amount be raised to a total of ID 750,000 over the next five years. More could probably not be spent in this period because staffing and organization will take time and attention. In the ensuing five-year period, however, the amount might well be doubled.

XIII. Settlement of New Land

In the future much of the increase in agricultural production will inevitably come from the settlement of new land. Iraq is one of the few Middle Eastern countries which have large reserves of cultivable land. While the official estimates, which indicate that the area under cultivation can be almost tripled, may be questioned, there is no doubt that there are vast areas both in the rain-fed zone and in the irrigation zone which can be put to the plow. When water from the Habbaniya and Dokan reservoirs becomes available, for example, it will be possible to extend the area under cultivation from about 11 to 15 million donums; and if the Bekhme dam is built, still additional areas can be irrigated.

The way in which these new lands are settled and developed will in many respects be critical for the future of Iraq. If reserved

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423 for settlement by small-holders, they will make a significant contribution to the social and political stability of Iraq. They may make any strong demand for radical land reform unlikely in the areas now already under cultivation. If developed with the enlightened guidance of the government, the new settlements may ultimately furnish striking demonstrations of the value of more advanced techniques in agriculture and animal husbandry as well as in social organization.

654 423 Under a law approved by the Parliament in 1951 land recognized as government-owned *(miri sirf)* in the cadastral survey will apparently be reserved in the main for settlement by small-holders. However, land which can only be irrigated by high-lift pumps can still be granted in tracts up to 5,000 donums to individual holders. Projects for the development of *miri sirf* land are to be drawn up and carried out by the Development Board. Selection of the settlers and administration of the finished projects will be the responsibility of a committee headed by an official with the status of a Director General. Two or three other members will be appointed by the Council of Ministers. The area of each project will be a minimum of 2,000 donums in mountainous lands, 20,000 donums in flow-irrigated lands and 80,000 donums in the rain-fed region. Each settler will be assigned up to 20 donums in the mountainous areas, 100 donums in flow-irrigated areas, 200 donums in pump-irrigated and 400 donums in rain-fed lands.

Under the law every settler must agree to refrain from granting his rights in the land to others and from injuring his fellow settlers in any way, to follow the committee's instructions with respect to the cultivation of the land and the planting of a garden, and to build a house in accordance with plans prepared by the [425] committee. If he fulfills this agreement, he receives title to his allotment after 10 years without payment. For a further period of 10 years he has no right to alienate it or mortgage it except to the Agricultural Bank.

The law does not confine the distribution of land to qualified and experienced farmers. In fact, it specifies that up to 20 percent of the land in each project shall be distributed to retired army and police officers, soldiers and policemen who have served at least four years, and graduates of agricultural schools, provided the

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committee is convinced of "their agricultural capabilities". Under the same condition the committee is also to distribute up to 25 percent of the land to retired civil servants who have served at least eight years and to unemployed graduates of elementary, secondary and religious schools.

While the general intent of this law will meet with general endorsement, several of its provisions might well be reconsidered. First of all, it appears doubtful that the inclusion of the beneficiaries described in the preceding paragraph will advance the basic purpose of the law—namely, to establish a class of independent small farmers who till their own land. Most of these types of beneficiaries will have neither the ability nor the inclination to do the actual farming themselves. They will bring in others to do their work and may even become absentee landlords. Under such circumstances the evils of "petty landlordism" will tend to creep in.

Secondly, the size of the plots to be assigned to each settler seems in some cases to be too large. Fundamentally the allotment should not be bigger than that which can be managed by the average farm family without outside assistance. The size will, of course, depend on the machinery, tools and draft animals which can be placed at the settler's disposal from the very beginning. It is improbable, however, that a single family will be able to handle more than 100 donums. If a larger allotment is necessary in the rain-fed zone in view of the uncertain yields resulting from irregular rainfall, a special effort may have to be made to organize cooperatives to own and operate the machinery needed to till such units. The proposed assignment of 200 donums in pump-irrigated areas is presumably based on the assumption that some private person will provide the needed pumps against a substantial share in the crop, thus requiring each farmer to have a larger plot of land for a decent livelihood. Now that the government is likely to have ample financial means, there would seem to be no reason why it cannot either install and operate the pumping facilities itself for a nominal charge or finance the cooperative ownership and operation of such pumps.

Thirdly, the provision enabling settlers to acquire land without any payment whatsoever is open to question. In principle it is inequitable that no payment should be required for these exten-

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654 423 sive benefits, particularly in relationship to those who are not fortunate enough to be selected as beneficiaries. Moreover, the value of the benefits conferred may be all the more appreciated if some charge, which need not be burdensome, is made for them.

Fourthly, it may be desirable to reconsider the provision exempting the areas irrigated by high-lift pumps from distribution in accordance with the law. Apparently this provision was also dictated by the belief that the requisite pumping facilities would need to be provided by private investment and that such investment was unlikely to be forthcoming unless a comparatively large grant of land was made for development by high-lift pumping. In the future, however, public capital should be made available for the installation of such pumping facilities.

Finally, the safeguards against alienation of the land may need further strengthening. After the two consecutive periods of 10 years each, during which these safeguards would apply, it may still be desirable for the government to retain an option to purchase any of such land offered for sale. In this way it would be possible to prevent, if necessary, the gradual acquisition of excessively large landholdings in these newly developed areas.

A brief comment might be made regarding the settlement possibilities in the rain-fed zone. Much of the land available for such settlement may be submarginal from the standpoint of rainfall. Care must be taken, therefore, not to invest too much in the development of the lands the yield of which will be highly speculative. It is noted that the Department of Agriculture has drawn up an ambitious scheme involving the settlement of 1,000,000 donums and the establishment of 50 villages in northwestern Mosul near Balad Sinjar. There are indications, however, that the rainfall in this region may be insufficient to permit settlers to earn a good livelihood. If attempts are made to carry out this scheme, it is suggested that small-scale tests first be undertaken over a number of years.

654 423 241 166 The law for the development of *miri sirf* lands which has been discussed at length above is basically modelled on the 1945 act under which the Dujaila settlement was established in south-central Iraq near Kut. During the period 1946 to 1950, 1,058 farmers were settled in this area on 100 donum plots allotted from

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state-owned agricultural land. The system of cultivation is prescribed. Thus 40 donums must be devoted to winter wheat and barley and five donums to summer crops. In addition five donums are to be planted with fruit, although evidently only 350 of the older settlers have such gardens in which grapes, greengage, apricots and date palms have been planted.

On the whole, the Dujaila scheme has been conspicuously successful. There is no doubt that the settlers who formerly were poor sharecroppers are now far more prosperous and contented. Most of them are obviously proud of their accomplishments. Their mud houses, although not built according to standard specifications as originally planned, are larger and more substantial than those of other fellahin. As already indicated, interesting experiments with cooperative organization have been carried out. In addition a useful start has been made with the planting of trees along roads and boundary lines.

The Dujaila venture has not, however, been an unqualified success. The failure to install drainage facilities has led to progressive salination and already some of the land has been abandoned. The administrative staff on the spot totals 75 people. Even after allowing for the fact that the staff also controls the distribution of water within the scheme and the operation of two nurseries, this number seems excessive. Aside from insisting that five donums be planted to fruit trees, nothing has been done to improve agricultural and livestock practices. Thus the increased prosperity of the farmers is solely due to the fact that they have more land to till and do not have to surrender a share of their crops to a landlord. There is no agricultural extension service on the spot capable of working with the farmers. In fact, the Department of Agriculture is not even represented on the committee which directs the scheme. Two nurseries are located in the scheme, but they serve simply to supply fruit trees for garden plots and other trees and cannot in any sense be considered demonstration units. It is generally agreed also that the scattered mode of settling the people was ill-advised, since it ignored the need for a community life and made it difficult to provide such community facilities as safe water, schools and health centers.

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On the new settlements the government will have a unique opportunity to improve on the Dujaila project. To ensure that it becomes a model project, the planning of each settlement should be carried out in close cooperation with the Ministry of Social Affairs, the Ministry of Public Works, the Ministry of Education and the Ministry charged with agriculture. There must be an integrated plan with appropriate provision for public health, schools and adult education, agricultural extension, cooperatives and the like.

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XIV. Establishment of a Ministry of Agriculture and Land Use

The program outlined in this monograph does not involve large expenditures. Detailed estimates of the cost involved will need to be worked out, but it is unlikely that total expenditures over the next five years will be far from ID 7,500,000. The largest outlays—ID 2,900,000 and ID 1,450,000 respectively—would probably be for grain storage facilities and additional capital for the Agricultural Bank. Not much more than ID 250,000 may be needed for new tobacco warehouses. The continuing contribution to the Agricultural Machinery Administration has been assessed at ID 250,000, but more money would be required if plans to borrow from the International Bank for new equipment do not materialize. On forestry, probably not more than ID 750,000 could be spent in the initial five-year period. An arbitrary allowance of ID 500,000 might be made for financial incentives. The remainder of the total outlay would, however, really be the most important, for it would go, except for some miscellaneous projects, to expand and strengthen the agricultural and animal husbandry services which are vital to the future of Iraq.

The improvement of agriculture, animal husbandry, and forestry along the lines indicated requires an energetic organizational effort by an agency well staffed and vigorously directed. Within the existing governmental organization in Iraq, agriculture and animal husbandry are not given sufficient importance. These subjects should not be handled by subordinate departments in the Ministry of Economics but by a separate Ministry of Agriculture and Land Use.

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Some suggestions for the organization of such a Ministry might be given here. It would be advisable to have a permanent secretary immediately under the Minister to direct the administration, ensure the coordination of all activities within the Ministry and brief the Minister on all policy questions requiring his decision. He might be assisted by a foreign adviser at least during the organizational period. Within the Ministry the various agencies, departments and sections could be grouped as follows:

1. The sections dealing with ministry wide questions such as administrative and personnel questions, legal affairs, and economic research and statistics, all of which would be under the more immediate supervision of the permanent secretary. Within this grouping might also be included the sections under the director of research and experimental stations and the director of agricultural education and extension who would, at a later date, become directors-general of complete departments. The work in these fields will need to be closely coordinated.
2. The autonomous or quasi-autonomous boards and agencies such as the Tobacco Monopoly, the Agricultural Machinery Administration, the Grain Board, the Date Association and the Chambers of Agriculture. The character of these organizations is such that they do not fall readily under the regular departments of the Ministry.
3. Departments or directorates-general for animal husbandry, agriculture and horticulture, land settlement, and forestry. A section for agricultural cooperatives would be included in the Department of Agriculture. It is strongly urged that the committee that will administer the new land settlements under the law approved by Parliament in 1951 be integrated as a directorate into the Ministry of Agriculture which should, after all, be most directly concerned with the proper planning and operation of these projects.

On balance, the Mission does not think it desirable to bring the Department of Irrigation into the proposed Ministry of Agriculture. Both in the main report and in the monograph on irrigation it has stressed, however, the need to set up some machinery for coordinating the work on agriculture and irrigation and for consulting officials of the Ministry of Social Affairs on the health aspects of irrigation projects.

The organization of a Ministry of Agriculture will, of course, detract somewhat from the importance of the existing Ministry of

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000 Economics. The latter, however, will retain control over industry, oil, mining, foreign and domestic commerce, and the central collection and publication of statistics. In connection with the latter the Mission has suggested elsewhere that the Directorate-General of the Census be transferred from the Ministry of Social Affairs and merged with the Principal Bureau of Statistics into a single fact-finding agency. Moreover, the Ministry of Economics might also retain control of inland and maritime fisheries, particularly since fishing has no necessary organic relationship to agriculture with which it is now allied organizationally.

The success of the new Ministry of Agriculture will depend above all on its field service. Little can be accomplished without continuous and intimate contact with those who actually till the soil and raise livestock. Much of the effort in the future must be concentrated on building up such a service and attracting to it people of high calibre. A prerequisite to the success of such an effort is a substantial improvement in the pay and conditions of service which now obtain.

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APPENDIX

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TABLE I

AGRICULTURAL MACHINERY ADMINISTRATION BUDGET FOR 1950
(actual results)

REVENUE			EXPENDITURES		
Rentals of machinery	ID	40,262	Salaries	ID	11,073
Sale of agricultural machinery and tools		7,267	Cost-of-living allowances		4,844
Sale of spare parts		317	Transport		117
Fines		195	Transfer		7
Repairs of agricultural machinery		106	Furniture		1,317
Transport charges		584	Printing & stationery		290
Interest on deposits		2,376	Postal, telegraph and telephone charges		276
Sundry		138	Rent		1,330
			Water and light		1,664
			Machines, cars & fuel		40,981
			Buildings		30,284
			Bonuses		399
			Temporary officials and employees		20,679
			Sundry		4,557
Total	ID	51,245	Total	ID	117,818

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TABLE II

AGRICULTURAL MACHINERY ADMINISTRATION BUDGET FOR 1951
(estimates)

I. ORDINARY OR OPERATING BUDGET

REVENUE		EXPENDITURES	
Rentals	ID 50,000	Operation of garages and repair shops	38,726
		Agricultural machinery operation	48,708
		General administration	25,884
		Total cash expenditures	113,318
		Depreciation allowance	37,145
		Total expenditures	ID 150,463

II. CAPITAL BUDGET

REVENUE		EXPENDITURES	
Sale of machinery, tools, etc.	ID 20,000	Purchase of agricultural machinery	54,000
		Purchase of trucks, jeeps and tractors	21,500
		Imports of spare parts for sale	25,000
		Diwaniya shop	3,000
		Requisites for completion of shops	7,500
		Sundry capital expenditures	1,000
		Total	ID 112,000

III. TOTAL BUDGET

Total cash revenue	ID 70,000	Total cash expenditures	ID 225,318
		Total expenditures	262,463
Total cash deficit	ID 155,318		
Total deficit	192,463		

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ANNEX D

INDUSTRY

I. Iraq's Potential for Industrial Development

The economy of Iraq is predominantly agricultural. In recent years, however, a national desire for industrialization has become increasingly evident and is being actively encouraged by the government. In 1929, the government took the first step to assist industry by passing a statute known as "A Law for the Encouragement of Industry". It proved to be of little significance, however, as it failed to provide industry with any financial assistance. It was not until seventeen years later, when the government created the Industrial Bank, that the problem of obtaining the necessary capital was partially solved. As a result, industry has since made some noticeable strides and should continue to do so.

On the whole, however, industry is as yet little developed. Excluding the petroleum industry, modern industrial plants employ only 2,000 people and account for a total capital investment of only about ID 4,000,000 and an annual gross income of roughly ID 3,000,000. The very modern and important oil industry, on the other hand, provides employment for about 12,000 people. During the war a number of important industrial enterprises were started. Rising prices and difficulties in getting materials, however, retarded orderly progress, so that some of these new projects are still in the process of completion.

Natural Resources

There are ample resources for further industrial development. An abundance of oil and gas provides a cheap source of both fuel and raw material. Particularly as irrigation is extended, agriculture will become increasingly important as a source of raw materials such as cotton, sesame, linseed, and possibly sugar beets or sugar cane, soybeans and jute.

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135 Several geological surveys have located outcrops of iron, copper, zinc and chrome ores. The extent and quality of these ores, however, will not be known until further exploration work has been accomplished. There are surface indications of 30 percent elemental sulphur mixed with limestone but, as in the case of the ores, these deposits have never been adequately proven. Previous to the large-scale production of oil, some coal was mined, but actual reserves have never been fully ascertained. A large and potentially valuable salt dome was located near Basra when geophysical surveys were being conducted in connection with oil exploration. It would appear, therefore, that Iraq has a fairly broad range of minerals which might be worthy of exploitation.

Some Factors Affecting Industrial Growth

433 454 Some of the basic causes of industry's retarded development are lack of private investment, technical inexperience and inadequate markets. In the past capital has often been hoarded or invested in rural or urban property or in commerce, where the security or rate of return was believed to be higher than in industry. To some extent this tendency has been overcome through tax exemptions, tariff protection and the financial assistance of the Industrial Bank.

464 433 On the other hand, little is being done to increase the number of skilled workers and technicians through education and training. One of the biggest handicaps in apprentice training is the lack of elementary education. Employees who are unable to read and write obviously can neither receive written instructions, maintain material and inventory control, select proper repair parts nor attend advanced in-plant training classes. Until this is corrected, Iraq must continue to rely on skilled foreign technicians and, in some of the larger and more complicated industries, on foreign management.

The supply of common labor is now ample and will probably remain so for many years to come. A shortage of labor, should it occur, could be corrected by the employment of women in greater numbers and by further mechanization. Industry has not, however, reached the stage of development where this should be attempted, for a highly mechanized plant means high capital costs, greater

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overhead, increased maintenance and the need for a higher level of skilled workers. As long as labor is in sufficient supply, it will be better to use the available amount of capital to mechanize a considerable number of plants to a limited degree rather than to establish a few highly mechanized plants.

Limited internal markets, because of a small population of low purchasing power, restrict the number of industries which may be economically justified unless the product can be produced cheaply enough to find a foreign market. This condition, however, would be corrected to some extent through a rising standard of living, especially among the rural population. Improved methods of farming, increased irrigation, better sanitation and more intensive education should help to raise purchasing power gradually. As government measures to these ends begin to take hold, industry can expect the demand for consumer goods to increase at a much faster rate.

Iraq's geographic location is also a factor to be taken into account in planning industrial development. High transportation costs handicap those industries requiring the importation of a high percentage of raw materials from Europe and America. The same obstacle will, of course, confront industries relying chiefly on European markets for their finished product. The best prospects for industrial growth are, therefore found in those industries which, through advantageous production costs, are able to absorb the shipping costs or those in which shipping costs represent a very minor component of the market price of their product.

II. Possibilities for Industrial Development

Expansion of Existing Industries

Many industries, such as brewing, cement making and woolen textiles, are now in the process of expansion. Partly because of tax exemptions and reductions granted by the Law for the Encouragement of Industry, these enterprises are able to finance their expansion themselves. Other enterprises which can usefully be

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433 expanded will, however, require financial assistance from the Industrial Bank. This should be arranged just as soon as plans can be formulated.

Petroleum Development

382 315 [471] The further development of the oil industry can safely be left to the internationally-owned companies now operating in Iraq. Under an agreement finalized early in October 1951, subject to ratification by Parliament, the three major oil companies—the Iraq Petroleum Company, the Mosul Petroleum Company and the Basra Petroleum Company—undertook to increase their oil output to 30,000,000 tons per year by the end of 1955 and to turn over to the Iraq Government 50 percent of the profit on their production before the deduction of taxes. Although output in 1950 amounted to only about 6,000,000 tons, there should be no difficulty about attaining the agreed target. The oil resources of Iraq are immense, the reserves of the Kirkuk field amounting reputedly to 1,000 million tons, with the new fields near Basra offering equal promise. In the development of these fields and means of transport, the oil companies have already made an investment of close to ID 90,000,000, which is now beginning to yield a rapidly rising output. Development in the Kirkuk and Mosul field has already proceeded on the assumption that a production capacity of at least 22,000,000 tons would be achieved in a few years, and with the completion of the pipeline to Banias, Syria, there should also be ample transport capacity. The balance of the projected output, namely 8,000,000 tons, will have to come from the newer fields near Basra. This may require some increase in drilling and will necessitate additional pipeline capacity to Fao, but neither of these will be difficult to accomplish.

382 466 The oil companies have been among the leaders in Iraq in providing better conditions and amenities for their employees and in instituting schemes for training skilled labor and technicians. They have been criticized, however, for their failure to appoint more Iraqis to leading positions. Under the agreement already cited they have undertaken to send 50 Iraqi students per year to British Universities to study various subjects relating to the oil industry, and also to establish a school in Kirkuk to train 60 Iraqis yearly in technical oil subjects.

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By and large this new partnership between the oil companies and the government should prove mutually beneficial.

The Government for several years has been considering the building of a modern oil refinery near Baghdad. In recent months, final plans were formulated and arrangements for its construction have apparently been made. This refinery, estimated to cost at least ID 7,000,000, is designed for an annual capacity of approximately 1,000,000 tons and when completed should be able to supply all of Iraq's anticipated requirements for refined petroleum products except for certain specialties.

The project will probably make it necessary to close the Alwand refinery, owned until recently by a subsidiary of the Anglo-Iranian Oil Company,[1] now producing something less than 70 percent of Iraq's requirements. Likewise, the use of Kirkuk crude, which can be obtained by the Government at cost, will probably make it necessary to close down the small oil field near Khanaqin which supplies the Alwand refinery, since it is unlikely that the oil resources in and near this field can be developed to such an extent that investment in a pipeline for export of the crude would be warranted.

Cotton and Rayon Textiles

In 1947, a cotton spinning and weaving mill was started near Baghdad, with a pilot plant consisting of 5,000 spindles and 84 automatic looms. The second stage, which is something over 70 percent complete, consists of 22,000 spindles and 500 automatic looms. The plant is modern in design and includes dyeing, printing and finishing equipment. About one half of the equipment has been in full operation for over a year, and shows good returns for an uncompleted plant which has not reached stabilized operation conditions. When completed and when operating on a full three-shift basis, it is expected that the spinning mill will produce 6,000,000 lbs. of yarn annually. Part of the spinning capacity is used in making yarn for sale to other small textile mills or even for home industries for weaving into cloth. In Mosul, for example, there are over 1,000 hand looms in various small home industries

[1] By an agreement reached in December 1951, the government took over ownership of the refinery, retaining the AIOC subsidiary provisionally as its operating agent.

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which depend entirely upon yarn from the new spinning mill, now that importation of yarn from abroad is no longer permitted. The total consumption of cotton yarn by these smaller mills and home industries is in the neighborhood of 1,500,000 lbs. per year. They also make rayon cloth from imported yarn, imports in 1950 being about 500,000 lbs.

The weaving capacity of the plant, consisting of 584 automatic looms when completed, will produce approximately 15 million square yards of cotton and rayon cloth per year. This is, however, less than one quarter of Iraq's normal annual requirements for all classes of cotton and rayon piece goods.

The industry would be in a far better position to meet domestic requirements if the cotton mill at Baghdad as well as the cotton and rayon weaving plant in Mosul could double their designed capacity and extend their facilities to make a wider range of products such as shirting and poplin. The finishing, printing, and dyeing departments should also be expanded. To put these additional facilities into full operation would take approximately four years and even then it would still be necessary to import considerable quantities of various types of textiles.

The Mission recommends that such an expansion program be undertaken. The total cost would be about ID 1,300,000, of which approximately ID 900,000 would be in foreign exchange, mainly in pounds sterling. As before, the Industrial Bank, working in conjunction with private capital, should arrange to finance the additional facilities. Since private capital will be available for participation, there appears to be no need for a wholly-owned government plant for which ID 1,000,000 has been set aside in the ordinary budget for 1951-52. The new facilities will require the employment of approximately 1,500 additional workers in the textile industry.

Woolen Textiles

Woolen textiles have been made for many years. The first modern textile mill was started approximately 30 years ago. This mill, like the cotton textile mill, has a greater spinning than weaving capacity, so that yarn is available for local use both in knitting and in weaving by hand looms. The plant is equipped to make a broad range of fine fabrics and, along with other smaller mills, is

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fully capable of meeting all of the requirements of domestic consumption with the possible exception of minor items of a special nature. The plant's present capacity is 500,000 meters of cloth and 50,000 kilos of yarn. Recent improvements and expansion have brought the woolen textile industry abreast of the needs of the country.

Leather

Until recent years, there was little modern tanning of hides, most of the hides being exported. Since the war, however, several tanneries have been constructed and are now producing leather of fair quality sufficient for most of Iraq's needs, with the exception of those grades required to make the higher quality shoes.

Tanneries are not showing the profits which were originally anticipated, largely because they have to use hides of very poor quality. In many cases, the hides have been cut during flaying, while in other cases they have not been well preserved. The tanneries also have not attempted to make use of waste products and in some cases do not split the hides, a practice which is essential to low cost production. However, once these various technical problems have been solved, the tanneries should be able to meet all of Iraq's needs.

Shoes

Nearly 90 percent of Iraq's shoes are made by hand in numerous small home industries. There is one fairly modern factory, however, which, using both local and imported leather, now makes over 30,000 pairs of high grade shoes per year. The company has also set up retail outlets in all of the provinces. An increase in the capacity of this plant would do much to reduce shoe prices to the ultimate consumer. Annual production could be raised to 100,000 pairs by the procurement of additional equipment costing approximately ID 50,000, of which ID 45,000 would be in foreign exchange, mostly in Swiss francs. These facilities could be put into operation within two years and would increase employment from approximately 40 to 120 workers.

Vegetable Oil and Soap

A vegetable oil extraction plant has been in successful operation for approximately three years. It is designed to extract oil

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388 from the seeds of agricultural crops such as cotton, sesame and linseed. The linseed oil is blended and used in the making of paint, while the sesame and cotton seed oils are purified and distilled into light and heavy fractions, the light fractions being used as an edible oil, while the heavier are retained for soap-making. Although the expellers have a combined capacity of 20 tons of seed per day, the plant fails to satisfy present needs. Capacity should be increased by the installation of two additional mechanical expellers and a single solvent extraction unit to serve the entire plant. A washing plant should be installed for the purpose of reducing maintenance on the expellers. In addition to extending the capacity of the present facilities, new equipment is needed for the hydrogenation of oil for cooking fats.

Operating in conjunction with the oil plant is a soap plant with a capacity of 7.5 tons of laundry soap and 2.5 tons of toilet soap per day. This is estimated to be less than one third of present requirements. These facilities should be increased to take care of at least one half of the country's needs.

In all, the expansion program would cost an estimated ID 600,000, including ID 500,000 in foreign exchange, mostly in pounds sterling. It would probably require approximately two years before all of the facilities could be put into operation. Employment would be increased by approximately 60 workers.

Cement

331 Iraq's new cement plant is one of the more important projects sponsored by the Industrial Bank. The market for cement is expanding at a rapid rate and is well beyond the present plant's capacity of 220 tons per day. Additional equipment now scheduled for operation in 1952 will double the plant's output. Even so, production will fall short of domestic requirements. The larger plant should, however, reduce production costs and the cheaper cement should in turn open up many new markets in the construction and transport fields.

Brick and Tile

Brick is the prime building material. Over 30 private factories are engaged in the manufacture of bricks, and even though most of the plants are very antiquated, production costs are very rea-

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sonable. However, the quality of the brick, because of the type of clay available, is rather poor. The demand for brick is easily met by the present highly competitive industry. When, however, the cement plant is enlarged, it will tend to replace brick by offering better and cheaper material in such forms as concrete blocks. In view of this, there does not appear to be any justification for enlarging the brick industry.

At present, some tile is made, but it, too, is being replaced by cement.

Milling

Iraq possesses three fairly large flour mills. The older ones are now being modernized with the latest machinery. A very modern mill was recently constructed at Basra, with a capacity of 50 tons per day, for the purpose of making possible the exportation of flour rather than just wheat. So far, a shortage of grain has prevented the mill from operating as planned. When a sufficient supply of grain becomes available, however, the mill will be capable of serving the export market in addition to local requirements.

Aluminumware

Aluminumware is very popular. It is now being manufactured in a small plant in Baghdad from imported sheet, which represents more than 70 percent of the production cost of the finished article. Production is limited to about 480 tons per year because of the difficulty in getting aluminum; however, even with an ample supply of material, the present capacity of the plant (600 tons) is only sufficient to meet about one third of the country's requirements. Production costs could be greatly reduced, first, by increasing the capacity of the plant, and second, by installing facilities permitting the utilization of both scrap aluminum and pig. To double the plant's capacity and install equipment to melt and roll scrap and pig would cost approximately ID 200,000, of which ID 175,000 would be foreign exchange, mainly in pounds sterling. These new facilities would require about two years to construct and, when finished, would employ approximately 40 additional workers.

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Breweries

274 Iraq's only brewery, having a capacity of 50 barrels per day, is not adequate to meet market demands. The owners are therefore in the process of obtaining additional equipment to double the plant's output. The brewery, which has been in operation since 1945, is very modern in design and its product is of excellent quality.

Distillery

Iraq's only source of ethyl alcohol is a small, modern, well-designed distillery located in Baghdad. Surplus dates are used as raw material. Although they are not expensive, they are nevertheless more costly than the raw materials, such as molasses, which are used in the alcohol industry in other countries. Thus the distillery is operating at about one third capacity, since the market will not absorb its entire production at the prices it charges. Most of the current output is used in the making of the national alcoholic drink known as *arak*.

258 ***Date Packing***

Date packing is probably one of the oldest industries in the country. Market requirements have kept the industry very modern and fully capable of meeting all demands on it.

Matches

372 There are two match manufacturing companies in Iraq, both producing matches of very good quality. One company utilizes paper, and the other wood. Their combined production is equivalent to about one half of Iraq's requirements.

Cigarettes

277 The bulk of Iraq's requirements of cigarettes are made in the country from home grown tobacco. The output of 12 factories in 1949 amounted to 2.25 billion cigarettes, but there were in addition many small producers of handmade cigarettes. Even in the factories much of the work is done by hand, but further mechanization cannot be expected until labor becomes more expensive.

Small Enterprises

433 There are many small enterprises in Iraq which could be
445 expanded, such as tire retreading, reclaiming of lube oil, wood-

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working shops, battery and electrical repair work, shops for repair of automotive and agricultural equipment, bakeries, confectioneries and food processing establishments of various kinds. The amount of capital required in individual cases is quite small but, in the aggregate, it adds up to a considerable sum. The Industrial Bank should arrange for a small-enterprise section to make surveys of small industries in each community, advise them concerning ways of improving their methods of production and assist in getting proper financial help where it is justified. It is estimated that ID 400,000 would be sufficient to meet the needs of these industries over the next five years.

The assistance of small industries by the Industrial Bank is to be preferred to assistance or stimulation of so-called cottage industries. Cottage industries may be of benefit in the over-populated areas of Asia, but for Iraq they do not appear to be an appropriate solution to industrial growth. Iraq's population is small in relation to the resources available. Over the long term its problem is not primarily one of creating a maximum number of jobs with a minimum of capital but rather one of utilizing capital resources in ways which will make a permanent addition to the productive capacity of the country and to the building of modern industrial enterprises.

Establishment of New Industries

The entrance of industry into new fields would help to balance the over-all development of the country and to utilize its resources more fully. At the same time it would increase employment and thereby aid in raising the general standard of living.

Nitrate Fertilizer, Sulphur and Cement Plant

The largest and perhaps most promising possibility for new industrial development lies in the utilization of the natural gas produced in conjunction with oil. Upon completion of the 30-inch pipeline, oil production at the Kirkuk field will be at a rate which will make more than 25 billion cu. ft. of gas available per year. For the most part, this gas will be wasted until some means is found for its economic utilization. This gas contains, according

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382 387 to information afforded the Mission, 10.5 percent by volume of hydrogen sulphide with the remaining products being different types of hydrocarbons, chiefly methane. In the same area there are also large deposits of gypsum or hydrous calcium sulphate.

These waste gases and gypsum could be utilized for the economic manufacture of ammonium sulphate, a valuable fertilizer for agriculture; and, in the process, sulphur, carbon black and cement would become available as by-products. A plant of economic size and capable of satisfying approximately one half of Iraq's eventual needs should have an annual capacity of approximately 500,000 tons. In addition to ammonium sulphate, this plant would also produce approximately 100,000 tons of elemental sulphur and 300,000 tons of cement.

The most important part of such a plant would, of course, be that making ammonia. By this process, nitrogen and hydrogen under high pressure are synthesized into ammonia by means of a catalyst. Hydrogen for this process would be obtained by thermally cracking the gas and subsequently removing the carbon black, while nitrogen would be obtained by removing carbon dioxide and carbon monoxide from the flue gases.

The ammonia thus produced would then be combined with the sulphate radical from the gypsum. This is generally done by passing ammonia and carbon dioxide through a slurry of finely ground gypsum and mechanically separating the resultant products of ammonium sulphate and calcium carbonate. The ammonium sulphate which is in solution would be crystallized in evaporators while the calcium carbonate would be used in making cement.

Since the gas used in making ammonia must be free of sulphur, the plant would need to contain facilities for its removal. This could be accomplished in several ways, but a detailed study would probably show a combination of the Girbotal and Claus processes to be best suited for this particular project.

Facilities for the production of the required power and process steam would be conventional in every respect and would use gas for fuel.

In the first few years of operation, all of the products except cement would probably be exported. Later, however, only sulphur

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and carbon black might be exported, with the ammonium sulphate being utilized domestically as fertilizer.

The integrated plant is estimated to cost approximately ID 25,000,000, including foreign exchange estimated at ID 22,000,000 mainly in pounds sterling. The total estimated cost of the plant may be broken down as follows:

Ammonium Sulphate and Carbon Black	ID 14,750,000
Sulphur Recovery	8,750,000
Cement Plant	1,500,000
Total Cost	ID 25,000,000

Estimates indicate that the plant may show net earnings of 18.5 percent on the investment and may break even when approximately 40 percent of its capacity is utilized. In these estimates the gross income has been figured on the basis of c.i.f. prices currently prevailing in London and the plant has been amortized over 15 years with interest payable at 4½ percent per annum. The underlying calculation is summarized below:

GROSS ANNUAL INCOME			
Ammonium sulphate	500,000 tons @ ID 15 per ton	ID 7,500,000	
Sulphur	100,000 tons @ ID 16 per ton	1,600,000	
Carbon black	10,000 tons @ ID 93 per ton	930,000	
Cement	300,000 tons @ ID 5 per ton	1,500,000	
Total			ID 11,530,000
ANNUAL OPERATION COSTS			
Amortization and interest		2,310,000	
Freight (Rail and Ocean)		2,379,000	
Bags		650,000	
Maintenance		375,000	
Salaries		530,000	
Labor		146,000	
Material and Supplies		55,000	
Gas		135,000	
Contingency		300,000	
Total		ID 6,880,000	
Estimated Net Profit		ID 4,650,000	

The plant would probably need to be financed in its entirety by the Development Board, and it should be attempted only if a

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382 387 reliable foreign chemical firm can be secured to design and construct it and, at least at the outset, operate it under a management contract.

The plant would give permanent employment to about 1,000 workers.

387 297 ***Bone Meal Plants***

Another promising field for new industry is the conversion of the waste products from abattoirs to fertilizers for domestic use. Bone meal, for example, is a very valuable fertilizer. Yet at present Iraq, with no domestic plant to utilize them, is exporting approximately 15,000 tons of bones per year to Europe.

There would probably be sufficient demand for fertilizer to support three plants, located at Basra, Baghdad, and Mosul. Their combined cost would probably amount to roughly ID 50,000, of which ID 45,000 would be in foreign exchange, principally pounds sterling. With help from the Industrial Bank, this could probably be financed by the abattoir owners. When completed the plants would give employment to about 60 workers.

Steel

327 Iraq is now producing about 5,000 tons of steel scrap per year. It is recommended that a small hand-operated mill and electric melting furnace be set up to convert this scrap into reinforcing bars, window shapes and small angles, all of which are in great demand. This mill ought to be located in Baghdad and arrangements made to obtain off-peak power from the Baghdad power plant or from the railroad shops. As an alternative to electric melting, crucibles might be considered. In either case, the cost of the plant would be approximately ID 300,000, including ID 200,000 in foreign exchange, mostly in hard currency. This mill could not satisfy the whole of Iraq's steel needs; nevertheless, it would furnish about 5,000 tons per year of certain types at probably half the cost of the imported steel it would replace.

The mill could be financed by private capital with help from the Industrial Bank. Foreign technicians would be required dur-

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ing the first years of operation. Such a mill would give permanent employment to approximately 50 workers.

Concrete Batching Plant

Iraq will probably undertake in the near future a considerable number of construction projects for which poured concrete would appear to be the best material. It would therefore be desirable to locate in Baghdad a batching plant with ready-mix trucks to furnish the concrete. Standard steel forms would also be needed. A batching plant capable of producing cement for approximately 5,000 houses per year would cost about ID 125,000 in foreign exchange, mostly U. S. dollars. It could be financed by private capital with the assistance of the Industrial Bank.

Glass Works

During the war, two plants at Mosul remelted broken glass to make glass tumblers, etc. These plants are now closed as they are no longer competitive with imported glass.

It has been stated that suitable sand for glass manufacture has been located near Mosul. If the Department of Industries verifies the adequacy and suitability of this sand, then a new glass factory might well be constructed to make bottles, white containers and tumblers for domestic consumption. No attempt, however, should be made to manufacture flat glass. No recommendation is made in regard to the construction of such a plant, however, until adequate sources of material are proven.

Date Packing Crates

The cost of wooden boxes for the shipping of dates has steadily increased and represents a considerable cost to the date industry. At present, the practice is to import the boxes in pieces for assembly in Iraq. It is recommended that a small box plant be constructed at Basra to make these boxes from imported timber. This factory would require only a few power-driven wood-working tools estimated to cost ID 10,000, primarily in pounds sterling, and should reduce the cost of date boxes by at least 50 percent. The plant could be financed by private capital and sponsored by the Date Association. It would employ about 30 full-time workers.

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Machine Shop

392 There are about 150 very small machine shops in Baghdad. The total labor force in these shops is approximately 400. They do various types of metal work but by far the most important is the normal maintenance work on more than 3,000 diesel-driven irrigation pumps. While the workmanship is good, costs are very high because of the heavy overhead.

All of this work could be readily accomplished in one small, modern machine shop equipped with metal fabricating facilities, electric repair shops and including a modern foundry. With such facilities, not only could maintenance work on irrigation pumps and engines be carried out, but completely new diesel-driven pumps could be manufactured, replacing those now imported. It would, of course, be necessary to import special items such as fuel pumps, bearings and gears. Likewise, the design should be obtained through a license arrangement with some international firm. This plant would reduce the cost of present maintenance work by about one third and constitute the beginning of a modern equipment manufacturing concern. The shops thus replaced could be moved to rural areas to handle local automotive and agricultural machinery repairs.

The cost of such a machine shop would be about ID 600,000, including ID 500,000 of foreign exchange, mostly pounds sterling. It should be financed by private capital in conjunction with the Industrial Bank.

Jute Mill

287 [434] Jute products such as sacks, hessian cloth and twine are now being imported at the rate of about ID 384,000 per annum. The demand for such products is increasing and appears to be large enough to warrant establishment of a jute industry, even though the raw material will need to be imported. Ultimately it may even prove feasible to grow jute in Iraq.

The plant should be capable of making about 10,000 tons of jute products per year. The cost of such a mill would be about ID 500,000, including ID 400,000 in foreign exchange, mostly in pounds sterling. This mill could be financed by private capital and the Industrial Bank. It is recommended that it be located

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in Basra, close to both shipping and the agricultural area which may prove suitable for the growing of jute. It would employ about 300 workers. 288

Automobile Tires

The importation of automobile and truck tires is increasing at a rate of approximately 15 percent per annum, the value of all tires imported in 1950 being ID 468,000. 383 [429]

A plant of economic size to manufacture tires could be justified with a market of approximately twice that which now exists. Such a market will probably be reached in 1955. Since it would require approximately two years to construct a tire plant, it is recommended that plans be formulated to start such a plant in 1953.

The plant would be so designed as to utilize the maximum amount of labor and, accordingly, should cost no more than ID 750,000, including foreign exchange of ID 600,000, mainly pounds sterling. It could be financed by private capital with the assistance of the Industrial Bank. Foreign technicians would be required during the first years of its operation.

Salt

Geophysical work gives conclusive evidence of a very large salt dome near Basra. Unfortunately, the analysis is not known. This dome could be the source of very cheap salt for both export and domestic consumption. It might make feasible the establishment of an alkali plant, particularly since the nearby oil field would be able to furnish gas as a source of cheap power. It is recommended, therefore, that core drilling of this dome be started as soon as possible to permit a proper evaluation of the possibilities of its use. 135 [385]

Sugar Mill

Considerable thought has been given to the recommendation of a sugar refinery. Such an enterprise would, of course, have to depend on agriculture to supply the raw material, either in the form of sugar beets or sugar cane. Since this cannot be assured at this time, it is recommended that the development of this industry be held in abeyance for the present. 257

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Paper Mill

289 Iraq does not have a suitable source of material for a pulp plant at this time. The development of a paper making industry would therefore require the importation of pulp to meet its various requirements. This procedure would ordinarily be both practicable and economical; however, the world market for pulp is now very critical and may remain so for several years. It is recommended, therefore, that the paper mill be held in abeyance until an adequate supply of pulp is assured.

III. State Assistance to Industry

Financial Assistance

454 433 The widespread reluctance of private capital to venture into industry can be overcome only gradually as the profitability of industrial investment is demonstrated in various fields. In the meantime, it will be necessary for the government to furnish most of the capital for industrial development.

Plants which will require a large amount of capital and will need completely foreign management at least in their beginning may have to be financed completely by the government through the Development Board. The oil refinery and the fertilizer plant are projects which fall into this category. Other more modest undertakings will require relatively small amounts of capital and in most cases may be economically operated by Iraqi management even though some foreign technicians may be necessary. This combination lends itself to the use of private capital, which should be encouraged as much as possible by the government, by means of financial assistance where justified.

652 433 The Industrial Bank is now the principal agency for rendering financial assistance to the development of private industry. The Bank, which began operations in 1946, has already performed useful work in promoting industry. At the end of February 1951, it had outstanding loans totalling ID 238,650 and participations in industrial enterprises amounting to ID 629,272. It has been handicapped, however, by a shortage of funds, since the government has

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paid in only ID 600,000 out of an authorized capital of ID 1,000, 652
000. Its resources have to some extent been supplemented by 433
borrowing ID 100,000 and ID 200,000 respectively from the Awqaf Administration and the National Bank. The Mission suggests, therefore, that the Development Board gradually supply the funds necessary to increase the Bank's capital by ID 5,000,000. The Bank would be authorized to use this sum for making loans to, and investments in, industry within the framework of an over-all program approved by the Development Board.

The Bank's capital should be used primarily as a revolving fund. The Bank should generally dispose of its industrial shares whenever an enterprise becomes profitable and, therefore, capable of attracting more private capital. Profit-making assets should be kept only to the extent necessary to create a reserve against possible losses. While the Bank should presumably show a small profit to inspire confidence in its operations, it should not retain its participation in profit-making enterprises for the sake of maximizing its profits, particularly when this limits its ability to assist other industries.

The Bank at present is understaffed. The directors pass on projects without the benefit of expert assistance, and, as a result, some phases of a project may be completely overlooked. With a shortage of staff, the transaction of business with the Bank is also time-consuming and thus discourages applicants.

The Mission recommends that, first, the Bank's staff be both increased and strengthened and, second, that it be reorganized to give greater responsibility to the head of the Industrial Schemes Section who should be a properly qualified man with broad industrial experience. Members of the Industrial Schemes Section should have thorough training and practical experience in power and mechanical engineering with special reference to industrial planning and layout, and in operations, management and control of industry with special reference to cost accounting.

Protection of Industry

The "Law for the Encouragement of Industry" enacted in 654
1929 was replaced by new legislation in 1950 which grants limited 433
exemptions from income and surtaxes for four years; exemptions 651

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654 433 651 from import duties on machinery, material, equipment and spare parts; exemptions from property tax for 10 years; and use of rent-free government land not in excess of 25,000 square meters for a period of 10 years. Iraq-owned industrial enterprises can qualify for these benefits as long as they primarily use raw materials available in Iraq or produce goods imported in considerable quantities. Neither of these conditions is necessarily relevant to efficient production; and it is therefore suggested that the law be amended to stipulate that such benefits should be accorded only to enterprises which have a reasonable prospect of becoming efficient enough to withstand foreign competition.

Industry is protected in many cases by high import duties and in some cases, such as cotton yarn, beer and cement, by import prohibitions. Industrial enterprises have not so far taken full advantage of these restrictions, but if they should do so the demand for their products would undoubtedly diminish significantly.

Foreign competition is always a useful check on inefficiency. Its beneficial effects in bringing about lower production costs and a better product have been demonstrated many times in Iraq. For example, even industries protected by high tariffs have been forced to modernize in order to reduce costs and meet competition. To attempt to shut out foreign competition will, in general, retard, rather than foster, industrial growth. In some cases, it is true, new industries may need protection during the early years of operation. Protection should not, however, be allowed to become a permanent shield for inefficiency; as experience is acquired and production costs are stabilized, protective measures should be greatly reduced.

In a country like Iraq where the limited market affords opportunities for only one or two plants in certain fields, there is an acute danger of monopoly and attendant high prices. This danger is aggravated further by a tendency in some industries to emphasize limited production with high profits per unit rather than mass production with lower unit-profits. Foreign competition would appear to be the proper means of restraining trends toward monopoly within a particular field, just as it operates to stimulate modernization in plants suffering from high costs because of obsolete methods.

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Technical Education

If industrial growth is to be accelerated, it is essential that measures be taken to provide industry with skilled labor. The Industrial School at Baghdad was established to meet this need. The curriculum of the school, however, lays too little emphasis on practical training and the graduates show a disinclination to work with their hands or to take secondary positions. It would be far better to rely on apprenticeship systems for basic practical training and to use the school primarily for supplementary instruction of a somewhat broader character which might be needed by the more highly skilled workmen and foremen. Those trained in the shop or on the site would then be recruited from the ranks of the laboring class which is accustomed to manual work.

Apprenticeship systems have worked well for the Iraq Petroleum Company, for the national railways and the Basra Port Administration, all of whom have highly skilled workers trained in their own shops. Each of these organizations possesses large machine shops which could be used to train many more workers than at present. The Mission suggests that the government, through the agency of the Industrial School, enlist their cooperation in enlarging their programs to train workers for industry generally.

Commercial and business education is also important. Banking, commercial and industrial firms, as well as the government, are all handicapped by the shortage of competent typists, stenographers, bookkeepers, clerks and accountants. In industry the training of good cost accountants, capable of checking the efficiency of various types of operation, is especially vital. A single secondary commercial school, supplemented by a night school, and a higher College of Commerce and Economics have been established to meet the need for business training. The first appears to be functioning along sound lines, although it suffers from inadequate quarters and a limited teaching staff. As soon as competent teachers can be trained or recruited, secondary commercial schools should be opened in the other principal cities, particularly Basra and Mosul. The College, on the other hand, leaves much to be desired from the standpoint of both the curriculum and the standard of instruction. It apparently produces neither competent and practical bookkeepers and accountants, nor people well grounded

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463 874 in economics and finance capable of acting as company secretaries or as economic and financial experts in business or government. Greater emphasis should be placed on practical training; the teaching staff should be strengthened; and more attention should be paid to banking and accounting, particularly cost accounting. Advisory committees consisting of representatives of leading banks and business houses should be appointed to both the College and the secondary school to review the curriculum. They could assist in arranging for part-time apprenticeship training and would provide a means for checking how well graduates of these institutions measure up to the requirements of business.

Effective Government Organization for Industry

647 654 Government activities relating to industry, except for the Industrial Bank, are now handled by a Department of Industry in the Ministry of Economics. This Department under its present director concentrates primarily on research and laboratory work and is not equipped to analyze and record the commercial and economic operations of industry. As industry expands both types of activity will become increasingly important. The Mission therefore recommends a realignment of the present organization to provide for two separate departments within the Ministry, a Department of Industrial Research and Standards and a Department of Industries. Research and technical functions now being carried on would be continued under the Department of Industrial Research and Standards. Its facilities need, however, to be expanded to meet industry's growing requirements for laboratory testing and quality control.

The newly organized Department of Industries would carry on economic research and analysis. Among its functions would be the maintenance of adequate statistical records of industrial production, the analysis of economic problems relating to industry such as marketing, and the administration of the laws providing special protection to industry.

Both departments should gradually be equipped to give increasing assistance to industry in improving its output and reducing its cost of production. This type of assistance should be stressed more and more in the future, as compared to special mea-

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sures of production and assistance which tend to shield industry against competition. There is much to be done to help industry to achieve better control of the quality of its products, in reducing waste through material salvage, in analyzing production costs, in making market surveys and in raising labor efficiency through improved lighting, noise abatement, in-plant training programs and better work flow.

IV. Other Suggestions for the Improvement of Industry

Possibilities for Economies in the Use of Capital

Whenever the capital cost of a plant is an important determinant of production costs, it becomes essential to utilize the plant to the fullest extent. This may be accomplished, for example, by increasing the number of shifts, by extending the work week and by stepping up machines to their maximum economic speed. Completely integrated plants seldom if ever offer the opportunity for this type of operation, because certain machines are never called upon for continuous use. This is, of course, very noticeable where the plant does all its own maintenance work, even to all of its foundry items. The solution is obviously one of resorting to contracting or sub-contracting with concerns specializing in particular operations. For example, a single finishing and dyeing concern might advantageously serve two or more textile mills, where the capacity of these mills is insufficient to load separate finishing departments to their economic limit.

In Iraq there is a tendency in industry to generate its own power rather than to purchase it. This leads to the installation of expensive facilities which are utilized only part of the day. While industry is operating, many municipal power plants stand virtually idle because they serve primarily lighting needs and their peak load accordingly comes at night. In some cases, where large quantities of process steam are needed, industrial enterprises may be justified in generating their own power, but for the most part, the purchase of power is preferable. Unfortunately, power rates, except in Basra and Baghdad, are so high that the purchase of

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power by industry is out of the question. It is hoped, however, that in time this may be corrected.

Even in Baghdad the purchase of power by industry would be greatly stimulated by a reduction in the industrial rates of the Baghdad Light and Power Company. Profits, after depreciation but before taxes, are now over half of gross receipts. Under the terms of its concession, the company pays a substantial part of these profits to the Iraq Government, the remainder being allocated to United Kingdom taxes, reserves for capital expenditure and dividends. The Iraq Government's share in the profits effectively constitutes a tax on electricity consumption, which it might be well advised to forego if it could thereby secure an equivalent reduction in power rates to Iraqi industry. The government might, therefore, explore with the Company and with the tax authorities in the United Kingdom the possibility of an equitable arrangement, whereby power rates would be reduced as far as possible, while still providing adequate funds for capital improvement and continuing a fair return to stockholders. A possible arrangement that has to be considered is the exercise by the government at the end of 1954 of its option to purchase the undertaking as a going concern. If such a course should be decided on, it would be desirable to enter into a management contract with the Company in order to ensure the continuance of efficient operation.

The amount of working capital required in Iraq per unit of production is exceedingly high, partly because enterprises want to be as self-sufficient as possible with respect to needed supplies and materials, partly because Iraq is relatively distant from international markets. Probably the best means of reducing the need for working capital would be through the erection and operation of a bonded warehouse which would provide all industries with facilities to store, until needed, supplies, material and chemicals of all types under conditions that would enable banks to extend credits on the stocks in bond. In this way the banks would have assurance that the stored material would not be released prior to full payment plus interest, storage and service charges. In effect, this would permit operations along lines very similar to those in highly developed countries where supplies and materials are obtained in accordance with production schedules.

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Measures to Improve Productivity and Quality of Output

1. Improved Lighting, Noise Abatement and Temperature Control

Good lighting is important in reducing fatigue, improving the quality of work and increasing production. Light that glares has the same effect as too little illumination; in either circumstance workers tire easily and their efficiency is quickly lowered. In designing new industrial buildings care should be taken to avoid the direct rays of the sun and to arrange wherever possible for the light to come from the north through the roof. In many existing plants, especially in the two-story buildings, the amount of artificial lighting needs to be increased.

Tests have also shown conclusively that a continuous high level of noise quickly brings fatigue and boredom. The resulting loss in productivity fully justifies taking whatever steps are feasible, such as the installation of sound-absorbing ceilings, to reduce the noise level to generally acceptable limits.

While the average temperature in Iraq is high, the humidity is quite low. This greatly simplifies the conditioning of air for comfort, it being necessary only to increase the humidity to decrease the temperature. This practice, known as "desert cooling," is now being adopted with considerable success and should be extended in those industries (especially textile mills) where it is of distinct advantage.

2. Improvements in Flow of Material

With the exception of the new textile mill, industrial plants are poorly arranged from the standpoint of material flow. Most buildings have two stories, requiring either stairs, conveyors or elevators to move material through the plant. Columns to support the upper floor interfere with operations on the lower floor. Such an arrangement requires duplicate handling of material and interferes with the use of modern equipment such as fork trucks. Similarly, the buildings which comprise a plant are frequently laid out without regard to the flow of materials from one to the other. There are, moreover, many cases of duplicate operations (for example, separate power plants). While it is difficult to correct existing conditions, the layout of any new plants should be

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arranged so that the material flows through the plant with a minimum of handling.

3. Use of Time Studies and Cost Accounting

Time studies are indispensable in some industries. In textile and machine shops, for example, these studies are essential to break down production costs for proper evaluation. To illustrate, a large costly lathe might show a greater return by speeding up its operation through the use of a different design of cutting tool, or a planer might show such a low return that its replacement by a milling machine would be fully justified. In textiles, time studies might show that it is actually more costly to have one operator tending five looms than to have him tend only four looms; or the reverse could be true, depending on all of the related factors. There are numerous other examples which could be cited to show the need of time studies in certain sectors of industry.

Cost accounting is very important to good operations and must be practiced before an industry can expect to reach maximum operating efficiency. Without it, many losses, which could easily be avoided, go unnoticed by management.

4. Improved Administration

At present there is very little delegation of responsibility by management to foremen and supervisors. This limits the economic size of plants and tends to complicate the work of management. There are good reasons for this situation, chiefly the widespread lack of education, experience and training, which has already been described. While the basic problem can be overcome only in time, industry can take steps to alleviate the immediate situation through such measures as on-the-job training programs suggested earlier, special courses for supervisory personnel, and better organization of inventories and distribution of stores of spare parts. The result should be an increase in production and, at the same time, a reduction in per-unit cost.

5. Greater Emphasis on Workers' Welfare

To hire and train a worker requires time and money, and the investment is lost if, because of sickness, the worker is unable to hold his job or to turn out a full day's work. A physical examination prior to hire would insure that a worker is physically

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fit. After hire, improved working conditions and the provision of simple health services and adequate sanitary facilities would help to maintain his efficiency.

Living conditions outside the plant must also be maintained in a manner which gives the worker some degree of contentment and satisfaction. This might require new housing, better food, improved sanitary conditions or other changes, depending on the locality and type of industry. Most of these will, of course, involve further capital investment. The increase in worker efficiency when such measures are properly planned and implemented should, however, fully justify their cost.

Improvement in the workers' welfare ought to be a matter of concern both to the employers and the government. Inside the plant it is the primary responsibility of the employer; outside, that of the government. In neither sphere, however, is the jurisdiction or interest exclusive. For example, while a considerable improvement in working conditions in the plant can be brought about only if the employer realizes it is to his own interest, the government can and should intervene to maintain certain minimum standards. Legislation[1] with respect to working hours, holidays, sick leaves, disability compensation, child labor and the like, is already on the statute books, but the law has been poorly enforced. The staff of the Labor Department in the Ministry for Social Affairs needs to be strengthened to enable it to do an effective job. At the same time a special effort should be made to educate employers to the role of better working conditions in raising labor productivity.

[1] [IN IRAQ -- ANALYST.]

[304 IS BLANK]

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ANNEX E

TRANSPORT AND COMMUNICATIONS

489 Iraq's transport system, which is concentrated in the populated and cultivated eastern half of the country, converges on two points, Baghdad, the capital and trade center, and Basra, the country's only port.

504 The Port of Basra lies about 140 kilometers (85 miles) upstream from the Persian Gulf on the Shatt al Arab and is accessible to ocean-going ships of all sizes entering the Persian Gulf. Its site serves the economy of Iraq well, the junction of the cheaper ocean transport with the dearer inland transport being at the farthest practical point inland.

503 The Tigris and the Euphrates, together with their tributaries, offer natural transport routes. However, they have remained untrained and largely uncontrolled for centuries and, apart from a few short stretches on the rivers and their tributaries which are usable by local traffic, limited and restricted inland navigation is possible today only on the Tigris between Basra and Baghdad.

496 The railway system consists of three main lines, two of narrow gauge, one of standard gauge. One of the two meter-gauge lines is the main line from Baghdad to Basra, serving the most densely populated provinces besides connecting the two principal centers. The other links Baghdad with the northeastern provinces, east of the Tigris. The standard-gauge line runs from Baghdad on the right bank of the Tigris to Mosul, Iraq's second city, and beyond through a tip of Syria to Turkey, the Mediterranean and Europe. Until a year ago no physical junctions existed between the three main lines. Goods carried on both meter-gauge lines had to be ferried across the Tigris at Baghdad and then transshipped. The ferry has now been replaced by a bridge but the transshipment to and from the standard-gauge line remains necessary. Through passenger traffic between the three main lines is negligible.

491 A road system of approximately 8,000 kilometers (5,000 miles) covers the eastern half of the country, but most of the roads

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491 are unsurfaced and impassable for long periods in wet weather. All-weather roads are at present found only in the Baghdad area and in the mountains in the North. The only passable trunk roads are those from Baghdad to Khanaqin, Baghdad to Kirkuk, Erbil and Mosul, and Baghdad to Rutba and Syria. Even these have shorter or longer sections in very poor condition. There is no all-season road between Baghdad and Basra.

508 Two civilian airports, Baghdad and Basra, serve the principal
509 air routes between Europe, Asia and beyond. Internal air services are limited to one line between Baghdad and Basra. Military airfields and landing grounds and a few private air strips are available in certain places, but demand for internal air transport has so far been negligible.

509 One state air line, Iraqi Airways, operates services with
475 neighbor countries and Egypt through Baghdad and Basra with a small fleet of four aircraft. Administration and management of the airline are combined with those of the state railways.

315 Oil from the oil fields at Kirkuk is carried by pipelines across the country to the Mediterranean ports of Tripoli and Haifa, but the line to Haifa is now out of operation. A shorter pipeline connects the southern Iraq oilfield with the Shatt al Arab oil port at Fao.

489 Transport connections with the outside world are well served by the Port of Basra for ocean-going traffic, by the airports of Baghdad and Basra in international air traffic and by the oil pipelines to the Mediterranean. At present only one railway line, beginning at Baghdad, connects Iraq with Syria, and via Syria with Turkey and Europe. A desert road exists for through road traffic between Iraq and Syria and Lebanon. A private company, Nairn Transport, operates an international bus service on this route. There are two main roads for exchange of traffic with Iran, one from Baghdad via Khanaqin, and one from Erbil via the Rowanduz Valley and Rayat. Future economic developments may perhaps demand new traffic outlets to the Mediterranean, shorter and better equipped than the existing railway and road routes, but at present there are few signs of such a demand.

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On the whole the existing transport system serves the present needs of the country well, but there are certain shortcomings and problems. The principal difficulties are:

Insufficient means of transport in the Tigris valley between Baghdad and Basra, serving the Kut and Amara districts;

The lack of roads, shortage of surfaced trunk roads and non-existence of rural feeder roads;

The lack of control over road transport, urban as well as inter-urban and rural; and

The renewals and the gauge problems of the railways.

I. Ports

The Port of Basra was developed as a modern port from initial installations constructed during the first World War. During the second World War, the Port had to cope with a vast increase in traffic. Certain extensions, necessitated by military requirements, were carried out, including supply lines into Iran and through Iran to Russia, but normal maintenance, renewal and improvement works were severely restricted. The postwar period presented the problem of overcoming the arrears in maintenance and renewals, under an additional handicap of shortage of technical staff. Today the Port operates efficiently; it is equipped to handle all traffic, incoming and outgoing, without congestion and there is sufficient margin to cope with the increase in traffic to be expected from further economic development of the country. Particular credit must be given to the Directorate of the Port and a depleted but devoted staff for the results achieved.

The activities of the Port extend along the Shatt al Arab from the main wharves at Magil to the mouth at Fao. In addition to handling export and import traffic for Iraq, it also performs certain services for the Iranian oil port of Abadan; in recent years the number of ships calling at Abadan has been five to six times the number at Basra. The principal developments in the postwar period are set out in Table I. The activities of the Port cover a wide field. Besides actual port services such as harbor, wharves, sheds, pilotage, lighting and buoyage, civil, mechanical and elec-

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trical engineering maintenance and works, the Port Directorate is responsible for the Magil airport and hotel and for radio communications, meteorological service, road construction and maintenance, power and light supply, fire service and water supply, health and education services over a wide area.

TABLE 1

OPERATIONS OF THE PORT OF BASRA

Year[1]	Cargo in Transit[2]	Total Tonnage Through Port[3]	Number of Ships		Gross Tonnage of Ships		Number of Staff
			Abadan	Basra	Abadan	Basra	
1942-43	273,847	341,415	814	637	5,554,550	3,659,127	652
1943-44	983,779	1,232,233	728	517	5,172,650	3,153,025	805
1944-45	759,111	1,061,525	902	439	6,904,399	2,619,431	806
1945-46	725,265	1,002,437	1,321	218	10,359,785	1,273,878	909
1946-47	724,334	1,199,459	1,500	244	11,118,810	1,434.178	989
1947-48	796,811	1,161,865	1,716	275	12,305,896	1,639,490	1,090
1948-49	713,100	1.583,318	2,018	352	14,755,192	2,011,566	1,059
1949-50	1,290,444	2,002,789	2,082	403	16,117,210	2,234,405	1,030
1950-51	439,153[4]	1,358,200[4]	1,936[5]	338[5]	15,321,115[5]	1,823,017[5]	1,025[5]

[1] Beginning April 1.
[2] Tonnage handled in the transit area at Magil.
[3] Total tonnage passed over wharf, overside and river.
[4] First 9 months.
[5] First 11 months.

The financial position of the Port is healthy in every respect. Practical economies have been pursued in the Port's operations; a general reserve has been built up; extensions, improvements, renewals and rehabilitation after the war have been carried out from revenues and properly maintained reserve accounts. Amortization and interest payments on the capital debt in respect of the Port's installations and equipment, supplied and financed by the British Government, have been made regularly, and the Port is now free from debt. The Port's dues and charges structure is well devised and, as shippers testified, reasonable in its levies on shipping.

A comparative statement of revenue and expenditure, covering all activities, for the war and postwar years is shown in the following table.

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TABLE 2

PORT OF BASRA BUDGET*

(in millions of dinars)

Year	Revenue	Expenditures			Balance
		Ordinary	Capital	Total	
1942-43	1.11	0.71	0.04	0.75	+0.36
1943-44	1.19	0.90	0.03	0.93	+0.26
1944-45	1.19	0.93	0.04	0.97	+0.22
1945-46	1.14	1.05	0.09	1.14	—
1946-47	1.25	1.14	0.10	1.24	+0.01
1947-48	1.51	1.27	0.22	1.49	+0.02
1948-49	1.66	1.50	0.18	1.68	−0.02
1949-50	1.62	1.43	0.19	1.62	—
1950-51	1.52	1.45	0.65	2.10	−0.58
1951-52	1.53	1.53	0.65	2.18	−0.65

* Actual budget figures for the years up to and including 1949-50; revised estimates for 1950-51, and budget estimates for 1951-52.

It will be noted that until recent years there was a surplus of income over both ordinary and capital expenditures. Current deficits are being met from the cumulative surplus of the past.

Development programs of the Port now in progress consist of an extension to the power station, extensions and improvement of roads in the Port area, machinery and plant for road maintenance, improvements of the airport, an extension of the hotel, new buildings, staff quarters, laborers' dwellings, river conservation work, and extensions and improvements to wharves and warehouses, including handling equipment. For the financial year 1951-52 the cost of this capital budget program has been estimated at about ID 650,000. Similar expenditures will be required in the years to follow.

The Dredging Scheme

The Port's most important maintenance works program is concerned with the dredging of the entrance channel through the Fao Bar, so much so that a separate budget is maintained for the Bar Dredging Scheme with its own revenues from dredging dues levied on shipping. Up to four and a half million cubic yards must be dredged in a year to maintain the channel's width and depth, at a cost of from ID 500,000 to 600,000 per year covered

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503 by dues received from Abadan and Basra shipping. The budgets of the Dredging Scheme are summarized in Table 3. It will be noted that until the last two years surpluses accrued even after allowing for capital expenditures.

TABLE 3

FAO BAR DREDGING SCHEME BUDGET[1]
(in millions of dinars)

Year	Revenue	Expenditures			Balance
		Ordinary	Capital	Total	
1942-43	0.44	0.34	0.01	0.35	+0.09
1943-44	0.51	0.39	0.01	0.40	+0.11
1944-45	0.69	0.45	—[2]	0.45	+0.24
1945-46	0.73	0.49	0.04	0.53	+0.20
1946-47	0.70	0.48	0.05	0.53	+0.17
1947-48	0.76	0.54	0.07	0.61	+0.15
1948-49	0.91	0.54	0.17	0.71	+0.20
1949-50	0.95	0.61	0.19	0.80	+0.15
1950-51	0.94	0.73	0.36	1.09	−0.15
1951-52	0.95	0.79	1.10	1.89	−0.94

[1] Actual budget figures for the years up to and including 1949-50; revised estimates for 1950-51, and budget estimates for 1951-52.
[2] Negligible.

Thorough investigations and studies by the Port's engineers and consultants, supplemented by experiments on a tidal model of the river constructed by the National Physical Laboratory at Teddington, England, have now reasonably well established that the dredging of a new channel straight from the mouth of the river should ensure reduced maintenance dredging after completion. The present channel, though shorter, has a bend near the river mouth and now runs at right angles to cross currents which deposit more and more silt in the channel. There is no doubt that the new channel should be constructed.

The dredging of this new channel is the only major development facing the Port authorities. The cost would be at least ID 2,000,000 spread over a few years, but the ultimate savings in current dredging expeditures would make it a very worthwhile investment. Part of the cost is already reflected in the Dredging Scheme's capital budget for 1951-52 which, for instance, provides

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ID 400,000 for the purchase of a new dredger. The Port cannot, however, be expected to finance the construction of a new channel out of its own resources. The combined current receipts of the Port and the Dredging Scheme, together with the surpluses of the past, should be sufficient to cover the cost of ordinary capital improvements, but not of a large project such as the channel. It was originally expected that the Anglo-Iranian Oil Company might lend the necessary funds for the channel. Recent developments have made this possibility more remote, and in any event it may now be much more advisable to finance the project out of the oil revenues which will accrue to the Development Board.

Proposed Port at Umm Qasr

From time to time proposals have been put forward for the construction of a new port at Umm Qasr, on an inlet from the Gulf, south of Basra. Temporary installations at this site and a military branch line of the railway from Basra were in operation during the war. The alternative was warranted in those exceptional years, in case war operations should impede the operation of Basra Port. The Umm Qasr port installations have since been abandoned and there is now nothing left which might be used as a nucleus for port development. The advantage of a shorter entrance channel which would require less dredging than the river to Basra is offset by the considerably greater cost of inland transport over sea-going transport. The entrance is not free from silting, and the Fao bar will still have to be kept passable for Shatt al Arab shipping.

For several other reasons this project should not be pursued further at present. Basra Port is capable of handling much larger volumes of traffic than at present. The construction of a new port would be expensive; a new town would have to be built; the port would duplicate, not supplement, existing facilities; and the port would require communications with the hinterland involving additional capital expenditures for railways and roads. As mentioned earlier the new port's site would be nearer the sea, thereby shortening the cheaper ocean haul and materially lengthening the expensive overland haul. Trade concerns now well established at Basra would be reluctant to duplicate their operations at the new port, let alone transfer their business there.

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504 *Staff*

The Port Directorate has done its best to train Iraqi personnel in every level of employment. It takes time to develop the highly specialized skills required but the training process is well advanced. In May 1951 two senior and seven assistant posts of primary importance remained unoccupied in the Port Administration, and two senior and two assistant posts of the same urgency were unfilled in the Bar Dredging Scheme offices. These should be filled promptly for a period of years by qualified foreign nominees. The training of Iraqi staff members in the Port's own territory and abroad should be continued and extended as much as is practical.

In summary, the Mission's recommendations concerning the Port's development problems are:

1. The training program to overcome the shortage of technical staff experienced in port operation, administration, maintenance and construction should be continued and expanded as much as possible.
2. The dredging of the new entrance channel should be carried out.
3. Construction of a new port at Umm Qasr should not be undertaken.

II. Maritime Shipping

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The Port of Basra is extremely well served by many experienced world shipping lines. There is, therefore, no justification for the creation of an Iraq shipping line. Coastal shipping is nonexistent, since Iraq possesses only one port and neighboring countries can provide no traffic for such a venture.

III. Inland Water Transport

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Nature has provided Iraq with a number of important waterways in its two large rivers, the Tigris and the Euphrates, and their many tributaries. Until a few years ago, the Tigris, in its lower reaches in the plains, was navigable at all seasons from

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above Baghdad to Basra, but this is no longer so. The variations 503
in the flow of water are wide, floods occur at high water, there is heavy silting at low water, the river bed steadily rises and the curvature increases more and more—features typical of the behavior of rivers which remain untrained for centuries.

The Port Directorate of Basra has control over inland navigation. The control is nominal, however, and is limited to the Tigris between Basra and Baghdad and the Gharraf canal, a tributary joining at Kut. There is a separate budget for the purpose but it amounts to only a few thousand dinars annually, spent on navigation aids, few and far apart. The last remaining regular navigation company, the Euphrates and Tigris Steam Navigation Company, ceased operations in 1949, and only small private concerns continue to operate barges which are mostly propelled by low-powered motor launches. [505]

At the present time the Tigris between Basra and Baghdad is navigable for vessels up to four feet draught during the seven months from February to August, except for short flood periods in April and May in some years. Navigation during the remaining five months, September to January, is impeded for long periods by:

1. Low water in the Narrows in the lower reaches below Amara, for periods up to three weeks,
2. Low water at Amara, causing the floating bridge to ground, for periods up to six weeks,
3. Closure of the Kut barrage lock for irrigation requirements, for periods up to eight weeks.

Between seasons the water levels vary up to 25 feet at Baghdad, up to 35 feet south of Kut barrage and up to 7 feet at the Narrows.

Inland water transport has ceased to be a factor of importance in the country's transport system. The waters of the rivers are used primarily for irrigation and their flow is controlled only with a view to serving irrigation requirements. In the future irrigation will continue to have the principal claim on the available water supply. This does not mean, however, that a revival of inland navigation will be incompatible with irrigation. In the monograph on flood control and irrigation it has already been pointed out that measures to control the dissipation of water from the lower reaches

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503 of the Tigris into the marshes would leave more water in the river bed.[1] Navigability might be improved further if the river bed were trained by dams, locks, groins and cribs into a narrow channel at low water and progressively wider channels at higher water levels. Through such measures, limited but uninterrupted navigation could be made possible. It would be necessary, however, to consider whether the cost would not be such as to make river transport uneconomic. As a first step it might be advisable to have the feasibility and cost of training the river bed studied by engineers from the Netherlands who have had experience with similar problems.

IV. Railways

496 The railways are the principal means of inland transport, carrying by far the greater part of the country's imports, exports and internal traffic. The chief commodities carried in bulk are oil, bricks, cement and other building materials, grains and dates.

The total length of the railway system is 1,030 miles (1,648 kilometers) of which 330 route miles (529 kilometers) are standard gauge and 700 route miles (1,119 kilometers) meter gauge. The first railway line in Iraq was completed in 1914 and ran north from Baghdad to Samarra as part of the projected Berlin-Baghdad railway. The Iraqi portion of this standard-gauge railway was not fully completed until 1940 and it is now the only railway link between Iraq and neighboring countries. The balance of the railway network consists of meter-gauge lines, large portions of which were first constructed during World War I when only meter-gauge rolling stock was readily available. One of these lines runs from Basra to Baghdad, following the Euphrates River. The other extends from Baghdad to Erbil via Kirkuk, with a short spur to Khanaqin. The part from Kirkuk to Erbil was finished only in 1949. Until 1950 when a railway bridge was completed across the Tigris, the two meter-gauge lines were connected only by a wagon ferry. Even now there is virtually no through passenger traffic on the two lines. It should be noted that there is no longer a railway south of Baghdad serving the towns along or near the

[1] See Annex B, *Flood Control, Irrigation and Drainage*, pp. 202-203.

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Tigris, although during each of the two World Wars there was a temporary railway connection with Kut. 496

The railways are state-owned and operated under the management of a Director General who is responsible to a Railway Board appointed by the government. The administration is autonomous and has its own budget which must, however, be submitted annually to Parliament for approval. The administration is well organized, the management capable and the operation efficient and economical. [475]

Capacity

The railway system consists entirely of single track lines built to light standards, and the permitted axle loads are very low. This limits the capacity of the lines and increases the operation problems. There is no doubt, however, that the system's capacity is ample for present demands. During several war years it actually carried about twice the tonnage of goods transported in recent years, even though the length of the system was only about one third greater through the temporary construction of military branch lines (see Table 4). 496 489

Railway carrying capacity is in reality rather elastic. The railways could carry as a minimum 15 percent more goods, and, in a pinch, could probably carry considerably more. In consequence of the over-all development program, traffic requirements will undoubtedly increase quite rapidly. For example, the value of imports may double within about five years, and the amount of

TABLE 4

TRAFFIC ON STATE RAILWAYS

Year	Route Kilometers	PASSENGERS		GOODS	
		Passenger Journeys	Passenger Kilometers	Total Revenue Tonnage Carried	Total Revenue Ton Kilometers
1943-44	2,011	4,418,590	662,256,369	3,586,081	905,104,309
1944-45	1,555	4,869,523	669,987,674	2,390,402	648,482,848
1945-46	1,555	5,292,441	775,107,476	1,970,107	513,643,871
1946-47	1,555	4,300,413	630,705,454	1,860,296	600,138,802
1947-48	1,555	3,725,463	529,066,676	1,714,290	556,623,270
1948-49	1,555	3,340,034	473,075,056	1,674,289	497,306,309
1949-50	1,648	3,609,337	517,939,859	1,980,795	657,097,000

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internal traffic, particularly in building materials, will also rise substantially.[2] The burden on the main trunk line from Basra to Baghdad will increase especially. If steps are taken, however, to carry out the necessary replacement and rehabilitation measures outlined in this monograph, the railways should be able to handle much of the increased traffic. Part of the increase will presumably be absorbed by the roads.

The financial position of the railways has not been wholly satisfactory in recent years. To be sure, they have had a considerable operating surplus until the last few years, as is indicated in Table 5. Since 1945-46, however, this surplus would have actually disappeared or been converted into a deficit if it had not been for the fact that the sum set aside for renewals and depreciation was rather inadequate. In 1948-49 a small surplus was achieved only because the amount appropriated to the renewals account was cut from ID 400,000 to ID 250,000; and when the

[2] See the Mission's main report, pp. 88 *et seq.*

TABLE 5

RAILWAY FINANCE
(in dinars)

Year	Operating or Ordinary Budget			Capital Expenditure
	Revenues	Expenditures	Balance	
1938-39	733,613	753,063	−19,450	938,115
1939-40	752,546	733,530	+29,016	559,492
1940-41	953,379	800,712	+152,667	176,866
1941-42	2,241,657	1,440,546	+801,111	159,937
1942-43	4,775,646	2,316,576	+2,459,070	161,905
1943-44	5,067,899	3,781,525	+1,286,374	137,258
1944-45	4,141,110	3,132,064	+1,009,046	112,366
1945-46	3,769,823	3,241,988	+537,835	387,684
1946-47	3,436,403	3,206,164	+230,239	789,095
1947-48	3,794,003	3,549,115	+244,888	1,761,123
1948-49	3,633,022	3,614,569	+18,453	2,778,902
1949-50	3,991,297	3,705,542	+285,755	1,068,558
1950-51*	3,949,200	4,041,400	−92,200	1,734,000
1951-52*	4,211,100	4,274,100	−63,000	902,500

* Budget estimates.

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provision for renewals was raised to more adequate amounts in the 1950-51 and 1951-52 budgets (ID 600,000 and ID 875,000 respectively) deficits developed.

The primary cause of financial difficulties was the large post-war capital development program. Following the prosperous war years, the government authorized the Railway Administration by Law No. 25, 1944, to carry out a major capital development program at a cost of ID 5,250,000. The program itself was, on the whole, sound and necessary, with the exception of the ambitious project for Baghdad-West involving the construction of an imposing new station and an entirely new railway layout. In included, among other things, the extension of the railway from Kirkuk to Erbil and the building of several new railway bridges, including one at Baghdad. It proved extremely difficult, however, to finance these and other capital expenditures. When the program was authorized, it was established that the railways themselves would be able to defray only half the cost. The rest was presumably to come from future government and railway revenues. Railway traffic and revenues, however, fell off rather sharply after the war, and beginning in 1948 the government became involved in serious difficulties as a result of the outbreak of war with Israel, the closing of the Haifa pipeline and two successive poor harvests. After making an initial 15-year four percent loan of ID 1,000,000 to the railways in 1947, the government could give no further financial assistance. In order to finance the rest of the program, the railways used up such balances as were available in the general reserve fund as the result of past surpluses and then depleted the funds set aside for depreciation and renewals. The latter, by the end of the fiscal year 1949-50, amounted to almost ID 2,600,000. Even then it was necessary in 1950 to meet overdue bills by placing a loan of £3,000,000[8] through the Export Credits Guaranty Department of the British Government. By the end of the 1950-51 fiscal year only £407,000 of this loan remained unutilized and this amount was earmarked for further payments to contractors for works already being executed.

[8] The interest on this loan is four percent and the principal is repayable over six years from June 30, 1952.

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As of the spring of 1951, when the Mission visited Iraq, the financial situation was about as follows. Capital expenditures had been reduced far below the amounts budgeted. Preliminary actual budget figures for the first half of 1950-51 indicated that total capital expenditures for the year might be only about one fourth of the amount authorized by the budget. For 1951-52, projected capital expenditures had been slashed well below the original estimates of the preceding year. The railways needed about ID 1,500,000 to meet commitments for the completion of capital works under way. More important, deferred renewals of locomotives, rolling stock and track were becoming more urgent just when no money was available to meet the cost.

The Palmer Report

Growing concern and anxiety about the railways' financial position led to a decision in 1950 to seek advice from independent consulting engineers. In May 1950 Messrs. Rendel, Palmer and Tritton, consulting engineers of Westminster, London, were invited to investigate and report on certain affairs of the railways in accordance with the following terms of reference:

1. To examine the railway accounts and ascertain the true financial position;
2. To examine and advise on the sanctioned Major Development Program in its economic aspects, with particular regard to the financial position of the Railways;
3. To advise on the rehabilitation and modernization of the system; and
4. To investigate and advise on the most suitable form of motive power for the system.

The investigations were completed and the Report issued in March 1951.

The Report is lucid and valuable, and its recommendations and suggestions should be implemented as far as practicable. Since it is clearly limited, however, to advice on developments with a view only to the economic and financial aspects of the railways, its recommendations may have to be supplemented and in some cases amended when considered in a wider framework.

The main conclusions of the Palmer Report can be briefly summarized. With respect to the accounts and financial position

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of the railways, the Report recommends that the renewals fund be restored and adequate allocations made for renewals in the future, that the financial department be reorganized to some extent and that the structure of rates and fares be studied and revised. On the Major Development Program the Report suggests completion of the Baghdad-West railway layout but on the basis of a revised plan. For the rehabilitation and modernization of the railways it proposes a detailed renewals program for a 10 year period and makes several minor recommendations. Finally, with respect to motive power, the Report recommends the conversion of the meter-gauge lines to diesel traction within 10 years.

The Mission approves these recommendations in general, but offers below a number of comments, amendments and additional recommendations so as to fit them into the wider field of coordinated economic development.

Financial Situation and Accounts

The Palmer Report envisages a renewals program costing ID 10,600,000 over an 11 year period. Of this sum it anticipates that the railways may be able to finance ID 8,175,000 out of current revenues on the assumption that the total set aside for this purpose from operating income can be gradually increased from ID 600,000 in the first year to ID 875,000 in the last year. A balance of ID 2,425,000 would therefore have to come from other sources. If it is decided, in accordance with a recommendation made later in this monograph, to standardize the railway gauge, the whole program of renewals will have to be considerably accelerated. The amount of financing required over the next five years will then be substantially increased.

The railways would undoubtedly be in a better position to finance these renewals out of their own resources if the administration were not burdened with expenses for other government operations, unconnected with the railways. For example, the railways have carried all the losses of the government airways throughout their existence, and the government has taken valuable railway land without compensation for projects entirely unconnected with railway operations while, at the same time, forcing the railways to pay high costs for new land required for railway use. The

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railways maintain at their own expense the many bridges used for the dual purpose of rail and road traffic, and they supply the necessary signalling and guarding services. The railway administration has built a costly rail and road crossing of the Tigris at Baghdad but must wait for the Road Department to contribute its share of the expense even though the latter requires the railways to pay for certain stores in advance of delivery. Finally, although the new Baghdad station with the elaborate new layout was conceived largely in the interests of town planning, the railways are expected to finance the entire cost and are also blamed for extravagance.

Some financial readjustments are clearly necessary to enable the railways to carry out the proposed essential renewals program. Further financial difficulties in the future can be avoided only if advance provision is made for additional capital projects and if the railways are adequately repaid for services rendered. It cannot be emphasized too strongly that, unless these steps are taken, the railways will, in a few years, become incapable of coping with normal traffic demands and those imposed by the country's development schemes; and there will be no alternative transport agency available.

In the field of financial administration the Palmer Report recommends the establishment of a Financial Committee inside the railway organization and the appointment of a Financial Secretary in addition to the Chief Accountant and the Auditor already in service. The Mission believes, however, that for a railway administration of the present size this may require too many leading officials in a single department. It suggests that no more than two persons will be needed to assure the three services, namely financial secretariat, accounts and audit.

The prevailing structure of rates and fares is not unsound but it is characterized by certain anomalies. In 1948-49 average goods earnings were only 209 percent higher than a decade ago although the wholesale price index in Baghdad had risen by 363 percent from 1939 to 1949. Moreover, the rate increases have been somewhat haphazard, varying from 50 percent for dates to 530 percent for tea, sugar and piece goods. In the summer of 1951 a further general rate increase of 12½ percent, with some exceptions, was put into effect. The rate structure is also defective in that all fares

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and rates per kilometer or ton-kilometer unit vary between the different sections of the system. They should be standardized. The abnormally wide variations in rates between commodities should be adjusted. The Palmer Report recommends the appointment of a rates and fares expert to study the matter. The Mission agrees that a traffic research officer with expert knowledge of tariff structure should be appointed as a temporary consultant to the railways. It is particularly important that he be conversant with traffic research so that he may provide for rate adjustments when traffic in certain commodities declines or increases exceptionally. With increased road traffic competition such research will become imperative in the very near future.

Baghdad-West Railway Developments

The plan for this major development scheme consists of a new terminal station building and railway headquarters to replace the existing separate Baghdad-West meter-gauge and standard-gauge stations, and the rebuilding and extension of the goods and marshalling yards. The plan was inspired chiefly by two desires, one to provide Baghdad with a modern central station, the other to make room for a town extension in the southeastern area planned on modern principles free from railway level crossings. The plans would necessitate the realignment of the line to Basra, around the development area so that it enters Baghdad terminal station from the northwest.

The Palmer Report rejects the official scheme principally because (1) increased length of the line to Basra would mean increased operating costs for the Railway and higher rates and fares for the public and (2) the operation of Baghdad station as a terminal instead of a "through" station would further increase operating difficulties and reduce the station's capacity. The Report submits a revised scheme in which the passenger terminal station is retained for the Mosul and Kirkuk lines, and the Basra line is retained along its present alignment with its own platforms, connected with the new terminal building. A plan for a provisional Stage I to bring the new station building into operation is also submitted.

The Report is on sound ground in pointing out the disadvantages of the increased mileage on the Baghdad-Basra lines

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and in stressing the disadvantages of operating the station as a terminal in so far as goods traffic is concerned. An additional major disadvantage of the plan would be that in the new alignments the two meter-gauge railway yards would be on opposite sides of the standard-gauge railway yard, thus presenting very serious operating difficulties. A terminal station for passenger traffic, however, presents a different case and would actually offer advantages in concentrated operations, safe and easy circulation of passengers, luggage, mail and parcels. But it is obviously out of the question to build a new passenger line outside the town and at the same time retain the existing line for goods traffic through the town.

It is obvious that a considerable time must elapse before a final decision as to the town planning, including government buildings, will be reached, and it is essential that at least the new terminal station, now nearing completion, be brought into operation. It is also desirable that no major reconstruction of yards be carried out until a final decision is reached. It is recommended, therefore, that a provisional plan be carried out, but on a modified, simpler scale than the Palmer Report Stage I. A modified plan is attached to this monograph as Appendix A. Its cost would be approximately one third of the Stage I project scheduled in the Palmer Report. In any case the Basra line platform should be sited immediately alongside the station building. It is indefensible to erect a terminal station costing ID 4,000,000 with the principal main-line platforms as appendices far away from the circulating area.

If future decisions for Baghdad town expansion demand the removal of the Basra line from its present alignment, the whole layout should be revised and the goods-marshalling yards constructed as a through yard, outside the present area, as indicated in outline on the plan attached to this Report as Appendix B. This layout would overcome the disadvantages of increased mileage and higher operating costs.

The Mission therefore recommends that the funds be made available for completing and bringing into operation the railway terminal station and headquarters and that an additional sum for a simplified provisional layout be also allocated. It suggests further that the new station building be used as follows:

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Ground Floor—half railway station, half airways terminal.*
First Floor —railway headquarters
Second Floor—non-railway offices

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Other Developments

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The Baghdad-West layout is not the only development project for which financial provision is needed. As the Director General of Railways indicated in a memorandum of March 17, 1951 to the Minister of Communications and Public Works, there are in all 22 projects, which are either completed or too far advanced to be abandoned. A list of these is given in Appendix C. On some of those completed, payments are still due; and others cannot now be finished for lack of funds, even though their completion is in the interest of the country's economy as well as the railway's operating efficiency. It is important, therefore, that the necessary funds be made available to the railways.

On the other hand, it will not be necessary at this time to provide for extensions of the railway network. Projects have been studied or suggested for new railways lines and extensions between

Kerbela—Kufa,
Baghdad—Kut, on the right bank of the Tigris,
Kut—Nasiriya,
Kut—Amara,
Amara—Basra

All these projects are in principle worth studying, but no decision as to their usefulness can be reached until the effects of road building and organized road transport on general traffic flow has been further investigated.

Rehabilitation and Modernization

In principle the suggestions of the Palmer Report should be adopted, although the extent to which they can be implemented in practice can be determined only after further study and recommendations by the head of each department concerned. Undoubtedly some further allocation of Development Board funds will be needed to carry out the ultimate recommendations.

Diesel Traction

Iraq's oil resources favor diesel traction, especially in view of the problems involved in supplying the water that steam traction requires. The Palmer Report has proved the case for diesel trac-

* See the subsequent section on airports.

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496 tion, and it is recommended that the trial period be begun at the earliest possible date with due regard to considerations set out in the following paragraphs dealing with possible gauge conversion. The cost of converting to diesel traction, estimated in the Palmer Report at ID 4,155,000, has already been almost entirely included in the projected outlay on renewals given earlier.

Gauge Conversion

One major problem remains practically untouched, that of unification of the railways' gauge. The problem has never been studied in detail. At various times estimates have been produced, usually at short notice and always based on the assumption of the necessity of complete replacement of track and rolling stock. It has often been forgotten that the construction gauge, formation, bridges, etc., of the meter-gauge lines were originally designed with a view to ultimate conversion to standard gauge.

There is no doubt that the division of the railway system in two gauges with a transshipment point at the center is a handicap to full traffic development. The question is whether the cost of conversion and the temporary disturbance of the free flow of traffic can be reduced sufficiently to be outbalanced by the increased efficiency and cheaper operation that the unified system would bring.

There are several reasons why the problem should now be studied in minute detail.

1. The long-term general development program of the country will probably entail capital expenditures of about ID 160,000,000 over the next five years and perhaps even larger amounts in later periods. Such an expenditure must result in increased production and consumption and in consequence increased transport. With this in view it might be sound and reasonable to include in the capital program a project for rail gauge conversion which would make railway transport more efficient.
2. Although existing administration, operation, service of workshops, stores, etc., for the two gauges are admirably integrated, there exists, of necessity, a large amount of duplication in activities, of reserves, of stand-bys and spares, in all departments.
3. The developments contemplated in the areas now served by the standard-gauge line north of Baghdad will be handicapped by transshipment on the main export and import route.

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4. The meter-gauge system is completely isolated from the standard-gauge systems in all adjacent countries; and such isolation may become a growing handicap to Iraq if additional rail connections become desirable in the interest of security or international trade. 496

5. Serious consideration must be given from now on to road transport. The proper economic use of both road and rail transport facilities will be much more difficult as long as the railway system suffers from a transshipment handicap.

A decision on gauge conversion should be taken now, in view of the major developments contemplated in the next five or ten years. Once these major developments are achieved with retention of the existing system, an opportunity for conversion, however desirable, will not recur again under circumstances as favorable as the present.

The major developments contemplated and directly affected by possible gauge conversion are:

1. Diesel traction to replace steam;
2. The intensive renewal program of track and rolling stock, which is now required in view of the age of the railway, and which must be carried out in any event;
3. The Baghdad-West layout in conjunction with town development.

It is emphatically recommended that the problem of gauge conversion of all meter-gauge lines be made the subject of a serious and thorough study in all its details. The existing railway staff is fully capable of doing this work; its members know all the local possibilities and difficulties, but, already overburdened in their day-to-day duties, they cannot possibly find the time to carry out the study alone. They should therefore be assisted by consultants for a period of, say, three to six months; and the consultants Messrs. Rendel, Palmer and Tritton might accordingly be recalled to carry out the study under the direction of the Director General and in close cooperation with the railway staff.

Such a study should cover the following subjects:

1. Assessment of the principal reasons for conversion;
2. A possible conversion program, completely integrated with the programs for renewals, introduction of diesel traction and completion of the Baghdad-West scheme;

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3. A five-year program of preparation involving:
   a. An initial test period of diesel locomotives and final transfer to diesel traction at the end of the fifth year;
   b. A concentration into five years of the program for track and rolling stock renewals projected by the Palmer Report. All the renewals to be for standard gauge, and no meter-gauge renewals beyond absolutely essential replacements from now on;
   c. A careful calculation of the extra capital cost involved, due consideration being given to expenses to be met in any case under existing operations, within the next five years or at some later time;
   d. A careful estimate of the savings in administration, operation, maintenance and renewal expenditures the unified system would afford.

A technical essay on the actual conversion work is attached to this report as Appendix D.

It is difficult to estimate the cost of the conversion operation in advance of this proposed study, but it may not be far from ID 6,000,000. As already indicated, however, it will also necessitate compressing the projected renewals program in a much shorter period. Thus, prior to conversion it would be necessary to carry out not only the renewals projected in the Palmer Report for the first five years, but also those contemplated for the meter-gauge lines in the rest of the period. Under those circumstances the outlay in renewals would be approximately as follows:

Mechanical (other than traction)	ID 2,000,000
Civil	3,400,000
Diesel traction	4,155,000
Total	ID 9,555,000

During this five-year period the railways would be able to finance only about ID 3,250,000 out of their own resources, i.e., through allocations out of current operating revenue. An estimated renewals deficit of ID 6,300,000 would therefore have to be financed over the next five years. Part of this might later be repaid out of railway revenues.

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V. Roads

Organization

Iraq's road system is controlled and maintained by the Public Works Department under the Minister of Communications and Public Works. It is headed by the Director General of Public Works and under his direction five divisional engineers assure the maintenance and works service in divisions centered in Baghdad (four provinces), Hilla (three provinces), Basra (three provinces), Kirkuk (two provinces) and Mosul (two provinces). A sixth divisional engineer is in charge of central operations in the capital. District engineers, usually stationed at the provincial capitals, are in charge of day-to-day maintenance. Planning is carried out at the headquarters of the Director General. There is a lack of technical staff to carry out surveys in the field. Except for this fact, the organization is efficient and effective. It may have to be expanded as the road construction program progresses. Provincial governments and municipalities control secondary and urban roads and streets.

At present the road system controlled and maintained by the Public Works Department consists of approximately

2,500 kilometers metalled and surfaced,
500 kilometers metalled only,
5,000 kilometers earth roads.

Many of the metalled roads were built in the two war periods, and most of them are concentrated in the immediate vicinity of the capital, between Baghdad and the East and North, and in the North. All the roads in the southern plains are earth roads, and their maintenance and use suffers from the effects of rains on the salt-impregnated soil. Roads within municipal boundaries are generally in a very poor state of repair, not excluding the streets in the capital. Roads in the Basra Port area are controlled and maintained by the Port Directorate and are in good repair.

Maintenance was, until a few years ago, extremely poor, but today every effort is being made, and with conspicuous success, at least to prevent further deterioration. Maintenance costs are allocated on the Ministry's budget and calculated at ID 40 per

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491 kilometer treated. For the present this appears to be about sufficient, but costs will increase as the system expands and traffic develops. On the completion of a metalled system of 7,000 kilometers, as planned, the costs would rise to approximately ID 70 per kilometer per year, a total of ID 490,000.

Road Construction

499 A program was drawn up in 1950 by a Committee appointed by order of the Minister of Communications and Public Works on February 7, 1950. The Committee consisted of the Directors General of Public Works, State Railways, Irrigation, and Surveys, and the Chief Engineer, a British road expert from the London Ministry of Transport temporarily attached to the Public Works Department in Baghdad. This Committee is a laudable example of departmental coordination, and the plan drawn up by the Committee shows unmistakably the value of this cooperation.

The program schedules 37 roads, of a total length of 3,463 kilometers, to be built, or improved as the case may be, in a period of 10 years at a total cost estimated at ID 14,500,000. Construction costs are expected to vary from ID 3,500 to ID 7,500 per kilometer, including drainage, culverts, bridges and costs of supervision. The program assigns first priority to the main trunk road, Baghdad-Kut-Amara-Basra, now an earth road, and the trunk road, Baghdad-Kirkuk-Erbil-Mosul, some sections of which are already metalled.

The roads are to be built to accommodate two traffic lanes, together six meters (20 feet) wide with verges for pedestrians, pack animals and cattle. Specifications drawn up by the Public Works Engineers provide for three types of foundation—stone blocks, broken stone or gravel, eight to nine inches thick; and for two types of surfacing—bituminous macadam or graveled macadam, three inches thick.

The program is sound and the specifications are effective. The Mission recommends that both be adopted as the basis of the future road construction plan, but with the following qualifications:

1. Although trunk roads like the Baghdad-Basra and Baghdad-Kirkuk-Erbil-Mosul arteries and a few others should have a metalled width of six meters and wide verges on each side, the initial width of metalled surface on other

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roads should be kept to four meters until traffic develops. Even on the latter roads, however, space for six-meter lanes and wide verges should be set aside. 499

2. Earth roads with little or no traffic at present should initially be raised to 50 centimeters, or somewhat less than two feet, above surrounding levels, with proper grading but no metalling until traffic actually appears. In this category should be scheduled such sections as Baghdad-Kut on the right bank of the Tigris, Diwaniya-Ur and Samarra-Shargat. The materials used for foundations ought to be selected from those found in the area, so as to avoid long haulage Suitable stone or gravel or even broken brick of sufficient hardness appears to be found within at most 100 kilometers of any given road section.
3. All depressions styled "Irish Crossings" should be removed.
4. Railway bridges should be disallowed for use by road traffic in trunk roads. The first bridge to be duplicated should be the Baquba bridge.

Feeder Roads

Agricultural and forestry development areas need feeder roads to the nearest railway station or main road or both, and provision for them should be made in development schemes for these areas. For the most part this could probably be done by improving existing country roads or tracks by grading, draining, and sometimes raising them. Good maintenance of these feeder roads is essential and might appropriately be assured by the provincial governments; generally only hand labor and a grader would be required. No hard surface is recommended for these roads. Assuming a total length of 8,000 kilometers for this system of secondary country roads, construction and maintenance of such a network would probably demand an expenditure of ID 100 per kilometer per year, i.e., ID 800,000 per annum in the initial period of five years.

One problem remains to be solved. The Public Works Department has no trained or skilled technical staff to carry out detailed surveys of existing or new roads. It is all important that correct location, alignment, levels, gradients, transition curves, camber and cant, etc., be established and maintained. It is therefore recommended that competent consulting engineers be engaged to do the plans and surveys and supervise the first large-scale construction, and that a nucleus of Iraqi surveyors be recruited to carry on [464]

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499 the work in the future. The work should be carried out by contractors of repute. Since they will generally possess the appropriate plant, it should not be necessary for the government to purchase any large amount of roadbuilding machinery.

Traffic

494 Road traffic is still extremely light in the country. As Table 6 indicates, the number of motor vehicles operating in Iraq is still very modest, and of this number most operate in or around the large cities. The personal observation of Mission members confirms that traffic density even on the most travelled roads is very low.

TABLE 6

REGISTERED MOTOR VEHICLES

Year	Passenger Cars	Buses	Trucks	Motorcycles
1942	4,522	n.a.	1,942	82
1943	4,333	n.a.	1,900	100
1944	3,972	n.a.	1,720	116
1945	3,771	n.a.	2,017	127
1946	5,902	n.a.	3,497	524
1947	7,422	n.a.	5,136	1,015
1948	8,678	n.a.	6,088	577
1949	9,601	n.a.	7,262	1,029
1950	11,438	3,007	6,381	1,636

n.a.—not available.

Road Usage

The improvement and construction of roads will undoubtedly bring about a rapid increase in road traffic in the future. It will then become necessary to regulate the usage of the roads. At present both the condition of the vehicles using the roads and their loading can only be described as extremely dangerous. On the many tours made on Iraq's existing roads, far too many of the very few vehicles seen on the roads were observed to be overloaded both with respect to the weight and to the height of the load. Top-heavy vehicles are particularly dangerous, especially on the sharply curved roads in mountains and gorges. Many bridges have been heightened—often in a way which is unsound structurally—to accommodate such vehicles. Vehicles unfit to operate endanger the safety

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of all road users as well as their passengers and cargoes. The expectation of increased road traffic makes it imperative that appropriate measures of control be devised without delay.

The following measures are suggested for adoption:

1. Construction of road weighbridges at suitable check points.
2. Compulsory inspection of all vehicles carrying passengers for payment and of all trucks before a periodic license is issued.
3. Appointment of qualified inspectors with sufficient authority and responsibility to ensure adequate enforcement of vehicle regulations.

With the development of traffic on the new highways it will be necessary to introduce and enforce proper traffic rules and regulations. The Mission, therefore, recommends that a highway code be drawn up and that traffic police be instructed and trained in the application and enforcement of the code.

Traffic conditions in the capital are at certain times of the day chaotic, even though city traffic is by no means dense. It would appear that, with training, the formidable force of traffic police now regulating the city's traffic could without expansion serve for traffic control on the country's highway system as well. It would pay the government to engage the services of a traffic expert, preferably from a metropolitan police such as London's, for a limited period, to design the highway code and to instruct the traffic police.

Public Road Transport

It will become increasingly necessary to regulate public road transport of passengers and goods by a licensing system. If this transport is left entirely free and uncontrolled, chaos will be the result; too many operators are likely to engage in public transport, run their services on borrowed money, find their vehicles run down before the loans are repaid and end in bankruptcy. The country's economy will suffer both from the waste of resources involved in such uneconomic ventures and from the probable need of protecting the railways by subsidies from the consequences of such wasteful operations. A reasonable number of capable private operators should provide healthy competition among themselves and with the railway.

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Transport licenses should be granted only if the proposed operator appears responsible and sufficiently well equipped to perform the transport services and if there is evidence of present or prospective need. Operators should be required to take out insurance, to adhere to published rates, routes and schedules, and to conform to loading regulations.

Maintenance

The maintenance of the new road system when once completed is even more important than its initial construction. Service and funds must be assured to keep the roads in the condition in which they have been built. The Minister of Finance should budget for annual expenditures, to be estimated by the Public Works Department, for maintenance of the road systems and all accessories including sign posting, for improvements necessitated by increased traffic, for inspection and control of road traffic and for the traffic police required. The expenditures should, in general, be covered by revenue from those who actually use the roads.

Subsidiary Roads and Urban Streets

It is recommended that at the earliest opportunity a system of cooperation between the Public Works Department and provincial and municipal road departments be established to bring maintenance, traffic control and municipal licensing in line with the government's policy in these matters and that appropriate provision for this cooperation be made in the budget.

City Transport

An essential part of the country's transport system is passenger transport service in the capital. Baghdad and its suburbs form a city of a population of over half a million spread over an area with a radius of four to eight miles. In 1938 it was decided to establish a municipal passenger service to be operated with buses. The war intervened and limited services were brought into operation in 1942 with converted army trucks equipped with locally built bodies. A loan of ID 500,000 was raised, more vehicles purchased and workshops and garages of sorts installed. The services deteriorated with the poor equipment, which was all that was available in wartime, and the municipality was unable to carry the financial burden. Early in 1950 the service was taken over by

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the central government. Since then it has been operated by an Administrative Board under the Ministry of the Interior, consisting of a Director General, who is president, and four other members. 365

The Board operates bus lines in and to all parts of the city and suburbs with a fleet of 236 buses of sundry makes and types. They are in poor condition owing to excessive service and the poor equipment of workshops and garages. At the time of the transfer to the central government, 70 percent of the vehicles were under, awaiting or beyond repaid. With effort the proportion has been brought down to just over 50 percent at present. A wise decision has been taken to standardize the type of bus to be operated in the future, and 100 new vehicles have been purchased at a cost of ID 500,000 to be paid over a period of three years. This sum includes a generous supply of spare parts. The services of one traffic and one workshop expert have been obtained on loan from the London Transport Executive to take up duties in Baghdad in September 1951.

TABLE 7

BUDGET SUMMARY FOR 1951-52

REVENUES		
Passenger traffic	ID	590,000
Miscellaneous (chiefly sales)		5,000
		595,000
EXPENDITURES		
Salaries and allowances	ID	47,150
Wages and allowances		227,600
Board, etc.		3,300
Administrative expenses		33,500
Maintenance and new buildings		16,000
Maintenance of vehicles		90,000
Fuel and oil		65,000
Loan service		61,662
		544,212
CAPITAL EXPENDITURE		
New buses	ID	205,000
Machinery and tools		7,000
	ID	212,000

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365 The operating position may be judged from a summary of the sanctioned budget for the current financial year, ending March 31, 1952.

Administrative expenses include a contribution of ID 2,000 to the Baghdad Municipality for maintenance of roads. The ID 90,000 for maintenance of vehicles is alarming. This high figure is caused chiefly by the large number of different types, the difficulties of procuring parts, the high cost of manufacturing substitutes and the large number of breakages of vehicle springs, axles and other parts due in great measure to Baghdad's bad roads.

A program to put the service on a sound operating, administrative and financial basis would include the following features:

1. Modernization of the central workshop and equipment, preferably moved to a site in the industrial section of the town.
2. Establishment of one central garage and four auxiliary terminal garages, all largely open air compounds, the latter to accommodate early and late services.
3. A fleet of 180 to 200 standard buses, to allow for reasonable running shifts and sufficient time for maintenance and servicing.

The Mission suggests that the cost of this program, estimated at ID 500,000, be financed by the Development Board. At the same time, however, it might be considered whether economies in administration could not be achieved by entrusting management entirely to a Director General rather than a Board, and whether revenues could not be increased by a stricter check on the collection of passenger fares.

VI. Airports

508 Both Iraq's international airports are very favorably situated within the town limits of Baghdad and Basra Port (Magil). This great advantage should be preserved and any developments should be on the present sites. Climatic conditions are favorable, and only a runway in one direction is required to accommodate traffic at all seasons. Town developments need suffer no inconveniences from

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the present sites, nor is surface transport by rail, road or water in any way hindered. Plans for removal of either airport away from the present site have been abandoned and ought not to be revived.

Development

Both airports are now scheduled to be built up to the specifications required for an International Civil Aviation Organization's Class B standard airport. The development projects embody the following works:

1. A runway of 2,500 meters to accommodate the newest heavy aircraft;
2. Navigation aids;
3. Communication, point to point, and ground to aircraft; and
4. Meteorological service.

It is recommended that these projects be carried out without delay. Some of the work is under way; equipment has been purchased, some has arrived on site. Work on the runways is still to begin. At the Baghdad airport an entirely new runway, parallel to the existing one, should be constructed and the existing runway, constructed as a temporary structure five years ago and now showing signs of deterioration, used as an aircraft taxi-way.

In addition to these projects already prepared and ready for execution, the present air terminal building at Baghdad, which has become too small, should be removed, and the wing of the new railway building facing the airport should be adapted for use as a new air terminal.

The capital expenditure involved in the projects may be estimated at between ID 250,000 and ID 300,000 for all works at Baghdad and between ID 100,000 and ID 150,000 at Basra airport. The latter expenditure appears to be within limits which can be financed from the Port's revenues. The former, however, will need to be financed out of the revenues of the Development Board.

VII. Air Transport

Since 1945 internal air transport has been assured as a part of air services to neighbor countries by the government-owned Iraqi Airways. The administration and management of Iraqi Airways are integrated with those of the State Railways, and for the sake

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509 of efficiency and economy this should remain so. The British Overseas Airways Corporation acts as technical adviser, deputizes personnel to the airways and trains Iraqi personnel.

Iraqi Airways operate regular services between:

Baghdad-Basra-Kuwait-Bahrein
Baghdad-Damascus-Beirut
Baghdad-Damascus-Cairo
Baghdad-Teheran.

The first route serves as an internal traffic link. The fleet consists of four aircraft: three Vikings and one Dove. In addition to the regular service, special flights with chartered aircraft assure seasonal traffic of pilgrims.

The first route serves as an internal traffic link. The fleet consists as is indicated in Table 8. The financial results, however, leave much to be desired. The operating accounts shown in Table 9 reveal substantial deficits which have been met from the State Railways' revenues. The Railways have also paid the initial capital outlay of ID 259,976 for aircraft and ground installations.

TABLE 8

AIRWAYS TRAFFIC

Year	Regular Lines Traffic					Pilgrims Charter Passenger Miles
	Mileage	Passenger Journeys	Excess Baggage Ton Miles	Mail Ton Miles	Cargo Ton Miles	
1945-46	80,953	559	709	0	86	7,770
1946-47	669,083	6,386	11,456	2,495	12,757	104,072
1947-48	779,159	12,397	26,694	9,314	64,087	175,563
1948-49	846,810	15,237	30,838	8,774	98,792	608,957

TABLE 9

AIRWAYS BUDGET

(in dinars)

Year	Cash Revenue	Cash Expenditure	Deficit
1945-46	5,504	13,587	8,083
1946-47	89,130	133,719	44,589
1947-48	106,580	187,600	81,020
1948-49	265,024	302,470	37,446
1949-50	257,280	363,172	105,892

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Future Developments

It must be expected that Iraqi Airways will continue to operate at a loss for some years to come. This should be accepted because the air services serve a real traffic need and there are reasonable prospects of reducing and perhaps ultimately eliminating operating deficits. The Airways Accounts are separate from the Railway Accounts and the steps recommended in the Palmer Report for complete separation of the finances of the Railways and the Airways should be adopted. There is no reason why the Railways should be expected to defray the deficits of the Airways.

There appears to be room for expansion of services in the area where Europe, Asia and Africa meet; and the government should encourage Iraqi Airways to play an increasingly important part in air traffic in this area. Internal demands appear to be negligible at present but may be expected to develop in conjunction with extended international services. These services appear to present an opportunity for far-reaching economies through closer cooperation between Middle Eastern airlines in their services, their administration and agencies outside the home countries.

VIII. Post, Telegraph, Telephone, Radio Communications

Organisation

Responsibility for communications is concentrated in the Directorate General of Postal, Telegraph and Telephone Services in the Ministry of Communications and Public Works. Iraq is a full member of the International Postal Union and the communications services of the country, including their tariffs, comply with the standards of the Union.

The number of post, telepragh and telephone offices has developed as follows:

Type of office	1940	1951
24 hrs. service	14	46
16 hrs. service	12	37
12 hrs. service	18	4
7 hrs. service	42	54
Local and rural agencies	155	171

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205 Mail is carried:

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on regular railway routes	1,604 kilometers
on contractors' routes (road)	3,010 "
on occasional routes (roads, tracks)	1,214 "
by air	a maximum of 14 daily routes

The only recommendation to be made regarding these services is to speed up air conveyance by moving the sorting center at Basra from Basra town to Magil.

Communications with other countries are as follows:

Postal services to all Union countries.
Telegraph and telephone with:
Iran by land lines,
Turkey by land lines,
Syria by wireless telegraph and land line telephone,
Transjordan by land lines,
Lebanon via Syria,
Saudi-Arabia by wireless telegraph,
Yemen by wireless telegraph,
Egypt by wireless telegraph (two services, government and Marconi),
Tangiers, relay point for wireless telegraph overseas,
United Kingdom by direct wireless communication (projected).

A British submarine cable from Fao to Karachi-Bombay has been out of operation since 1950. Repairs are not contemplated, and wireless telegraph has been substituted.

206 ***Internal Communications***

Trunk lines and carrier lines connect the towns and villages of any importance, and outlying villages and police posts are connected by wire from nearest exchanges. The telephone network is being continuously expanded, generally keeping up with demands. A new transmitter and a new broadcasting station have recently been installed near Baghdad.

The Mission suggests that an independent or at least auxiliary power plant be provided for the newly-built transmitter. A breakdown in the power supply, now assured by a long, open air transmission line, would have serious consequences.

The PTT service is a revenue earning department, but the revenues accrue to the government treasury so that all expenditures must be authorized by the government's annual budget. Operating revenue and capital expenditures are shown in the following table.

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TABLE 10 206

FINANCIAL ACCOUNTS OF PTT
(in dinars)

Year	Operating Revenue	Operating Expenditures	Capital Expenditures
1940-41	434,979	243,684	84,590
1941-42	481,809	298,688	25,931
1942-43	626,356	250,161	10,171
1943-44	669,057	447,110	23,688
1944-45	712,865	392,764	3,445
1945-46	748,110	449,238	18,554
1946-47	857,200	522,078	42,810
1947-48	991,741	587,913	303,355
1948-49	992,049	596,720	349,046
1949-50	1,119,478	747,193	298,510
1950-51	1,154,000	799,675	600,000*

* sanctioned

Developments

Major development projects are chiefly directed toward extensions of telephone communications, increased trunklines and carrier lines between the large centers, telephone lines to rural areas, and telephone exchanges to cope with the increased number of subscribers. The telephone equipment is ordered abroad, and the buildings are provided by local action. However, coordination between the two is almost completely lacking. Equipment more often than not arrives in Iraq before buildings are ready to receive it. Equipment is stored and maintained, in some cases for more than a year, waiting for the buildings to be completed and even, on occasion, to be started.

This fact gives rise to the Mission's single important recommendation in the communications field. Basically the PTT service should be given responsibility for the proper coordination of capital expenditures on communications no matter how financed. It has sometimes been suggested that the best means to this end would be to make the PTT financially autonomous so that it can spend its operating surpluses on capital development at its discretion. The Mission does not believe, however, that this would be the appropriate solution. In the last analysis the amount and rate of investment in communications facilities should be determined by the

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206 Development Board which is responsible for coordinating the development program of the country as a whole. The Board should also provide the financial means but leave to the PTT responsibility for execution of communications projects.

IX. Pipelines

315 Inconspicuous, but most important, in Iraq's transport and communications systems are the oil pipelines. The existing lines are: a dual line, 12 inches and 16 inches, from the Kirkuk oilfields to Tripoli, the Lebanese Mediterranean port: a 12-inch line to Haifa in Israel, closed in 1948; and a new 30-inch line under construction between Kirkuk and the Syrian Mediterranean port of Banias. A short line runs from the Basra oilfields at Zubair to the shipping stage at Fao. The pipelines carry a tonnage of oil which far outstrips the total carried by the country's railways. They are operated, maintained and expanded by the oil companies, and need only be mentioned to complete the picture of Iraq's transport system.

X. Surveys

654 No development in any branch is possible without maps and surveys. The Directorate General of Surveys, which is under the Ministry of Communications and Public Works, has surveyed and mapped the southern part of the country aside from the desert to scales varying from 1:5,000 to 1:50,000. Few topographical surveys have been carried out in the rest of the country, and the existing maps are not very reliable. The education and training of competent surveyors is difficult. Terms of service are not attractive to young engineers and surveyors who find better prospects in engineering, planning and construction work. Air surveys can, to all practical purposes, solve the problem and progress with them is now being made in the North. The skilled surveyors who are available are at present employed in cadastral work, land settlement surveys and mapping to fix the demarcation of land ownership.

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It is expected that once this work is completed, the personnel problem will ease somewhat.

The development program of the service provides for a survey and mapping to a scale of 1:20,000 at an estimated cost of ID 200,000. For the appropriate housing of the service, a new building with 10,000 square meters of floor space is now under construction and is expected to be completed in January or February 1952. This will facilitate administration of the service which is now scattered in three widely separated buildings. The new building will also house the up-to-date printing plant ordered in Great Britain. Funds for building and plant have already been sanctioned. Air surveys now in progress should be continued at an annual cost of approximately ID 40,000.

XI. General Observations

Teamwork

Not only the development of the transport services but also the general development program, with all its implications of temporary and seasonal demands for transport of construction materials and imports of machinery and plant, will materially affect the tasks before the transport managements. The teamwork in the existing transport departments is exemplary. It is therefore emphatically urged that no change be made in the present organizations and their leading personnel until after the main development programs are completed.

Intermediary Staff

In all the transport services there is a great dearth of intermediary staff—foremen, inspectors, surveyors, supervisors, and the like—for whom practical training in workshops and on construction sites is far more important than school or college education. In all transport development projects, special courses should be provided to train adaptable Iraqi apprentices under skilled teachers in shops, factories and on tracks and roads in the country.

These observations apply to all forms of transport, port, railways, roads, airways and communications. Unless continuity is maintained with a gradual, cautious transfer of responsibility from foreign to Iraqi personnel, efficiency will be seriously jeopardized.

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XII. Projected Cost of Proposed Programs

The projects recommended for consideration are summarized below as to cost and time of realization. The total cost which the Development Board might have to defray over the next five years would be approximately ID 31,000,000.

TABLE 11

COST OF TRANSPORT AND COMMUNICATIONS PROGRAMS SUGGESTED FOR DEVELOPMENT BOARD FINANCING

Project	Costs (in dinars)	Period (years)
PORT		
New channel	2,000,000	4
INLAND WATER TRANSPORT		
Study of river training by experts	Token	2
RAILWAYS		
Baghdad Station commitment	143,000	1
Baghdad new layout, provisional	100,000	1
22 continuation and completion projects under way	213,770	1
labor quarters	341,000	4
Rehabilitation and modernization projects	500,000	5
Renewals including diesel traction	6,300,000[a]	5
Extra for gauge conversion (tentative)	6,000,000	6
ROADS		
Trunk road system	14,500,000	10
Secondary road system	4,000,000	5
Road transport control	Token	1
URBAN TRANSPORT		
Baghdad transport services, workshops, garages and vehicles	500,000	3
AIRPORTS		
Baghdad development	300,000	2
Basra development	[b]	2
AIRLINES		
Iraqi Airways	600,000	4
POST, TELEGRAPH, TELEPHONE, RADIO		
Telephone extensions and buildings (if not financed from Communications budget)	300,000	Annually
Auxiliary power plant for transmitter	30,000	1
SURVEYS AND MAPPING		
Air surveys	40,000	Annually

[a] On assumption of gauge conversion.
[b] To be financed by Port of Basra.

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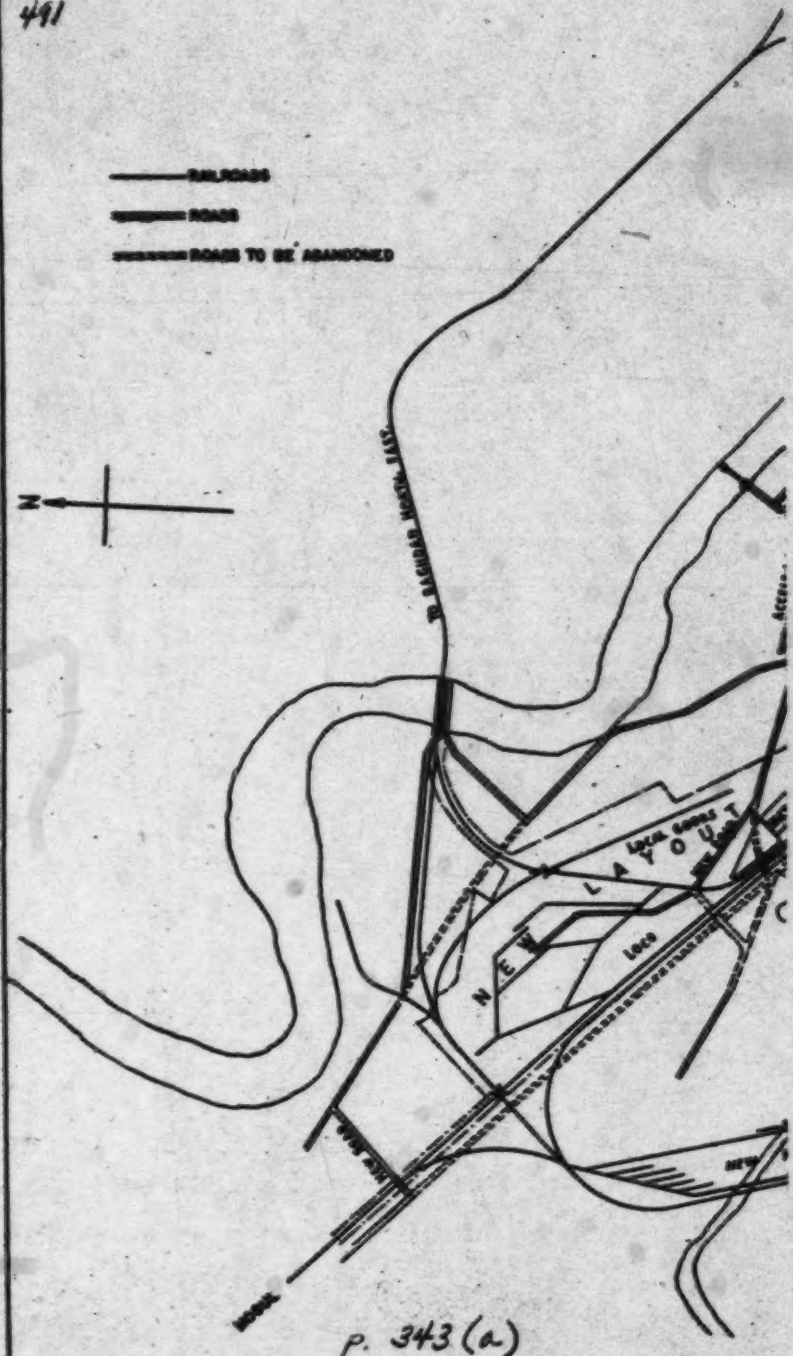

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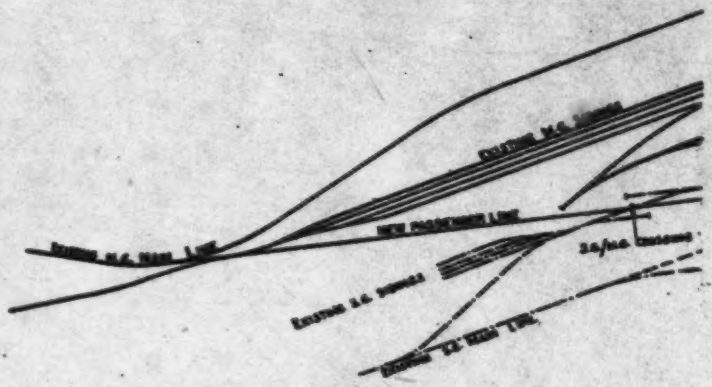

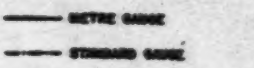

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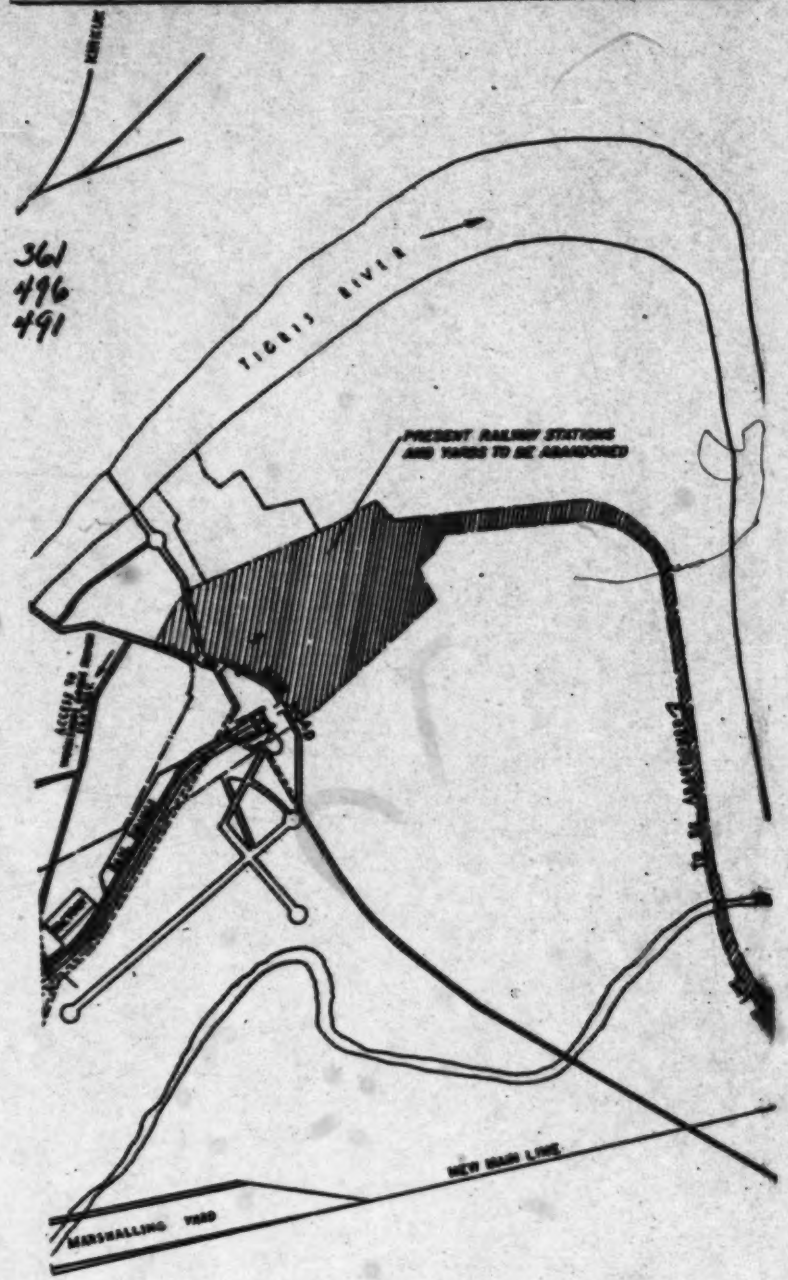

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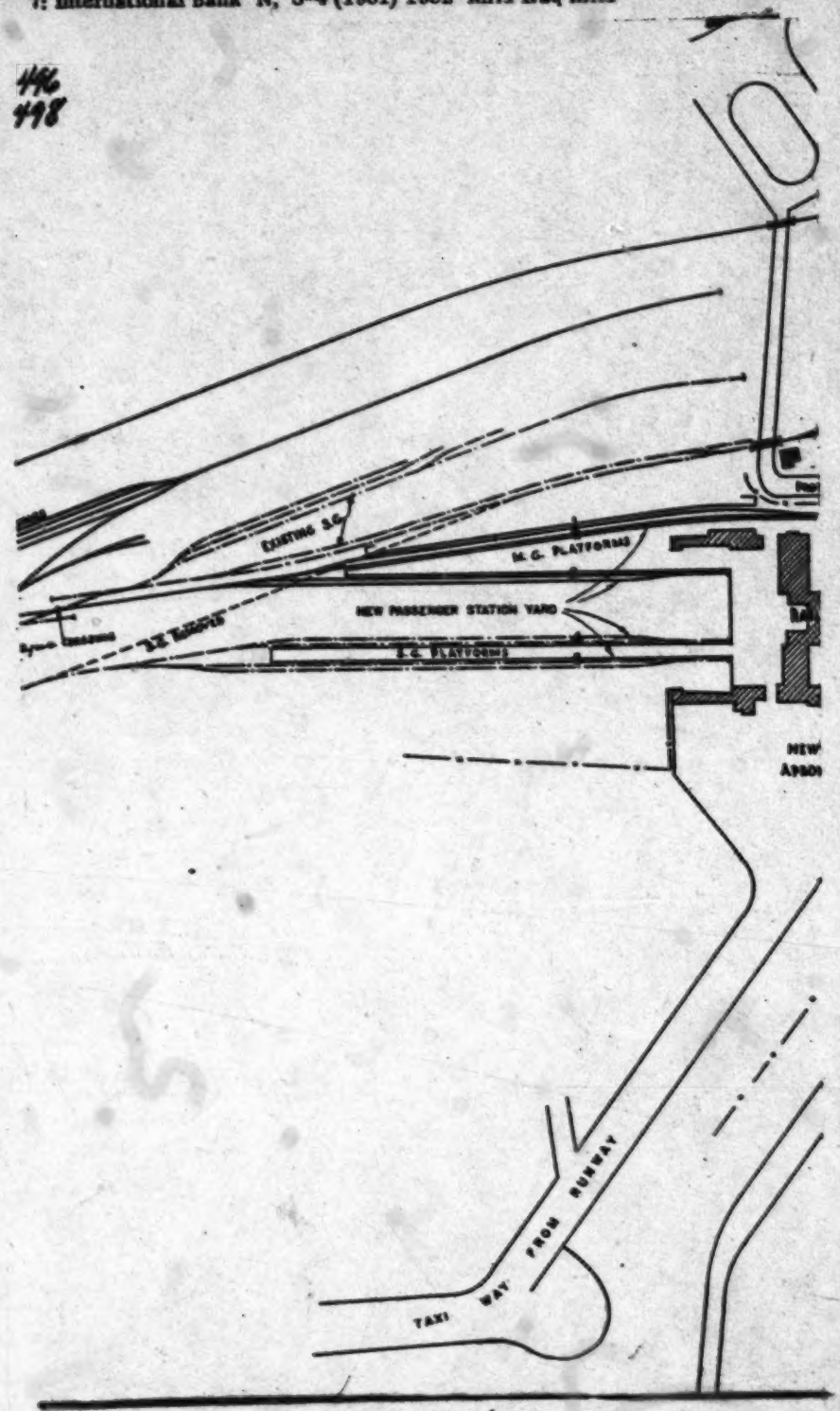

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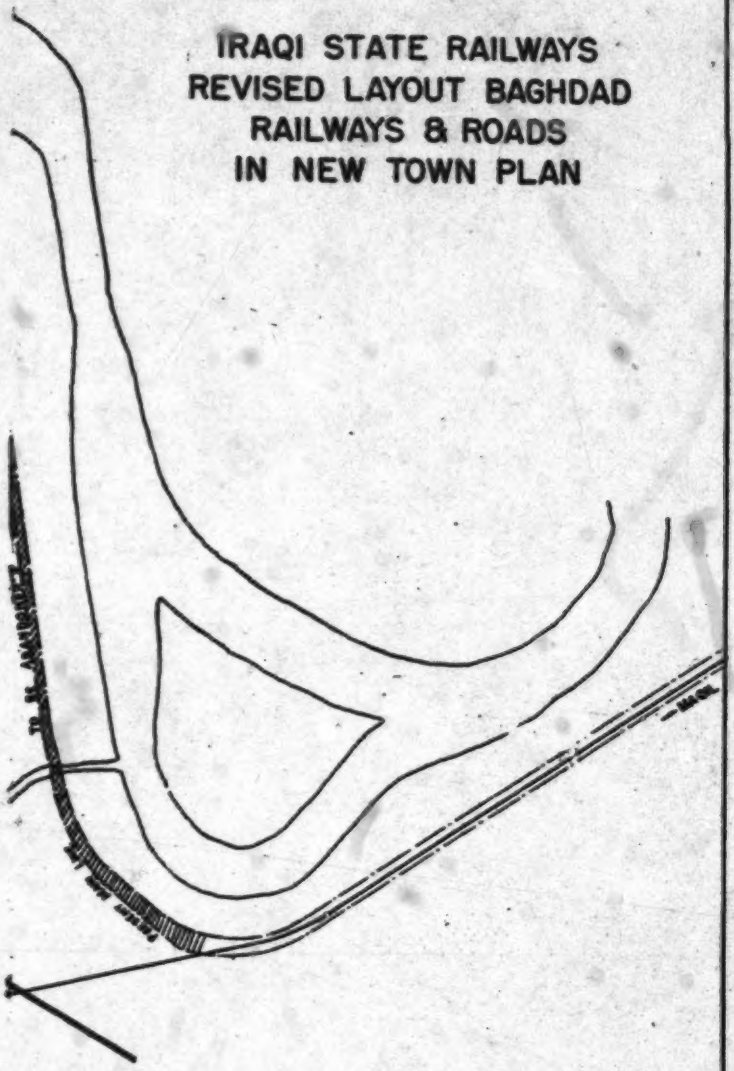
IRAQI STATE RAILWAYS
REVISED LAYOUT BAGHDAD
RAILWAYS & ROADS
IN NEW TOWN PLAN



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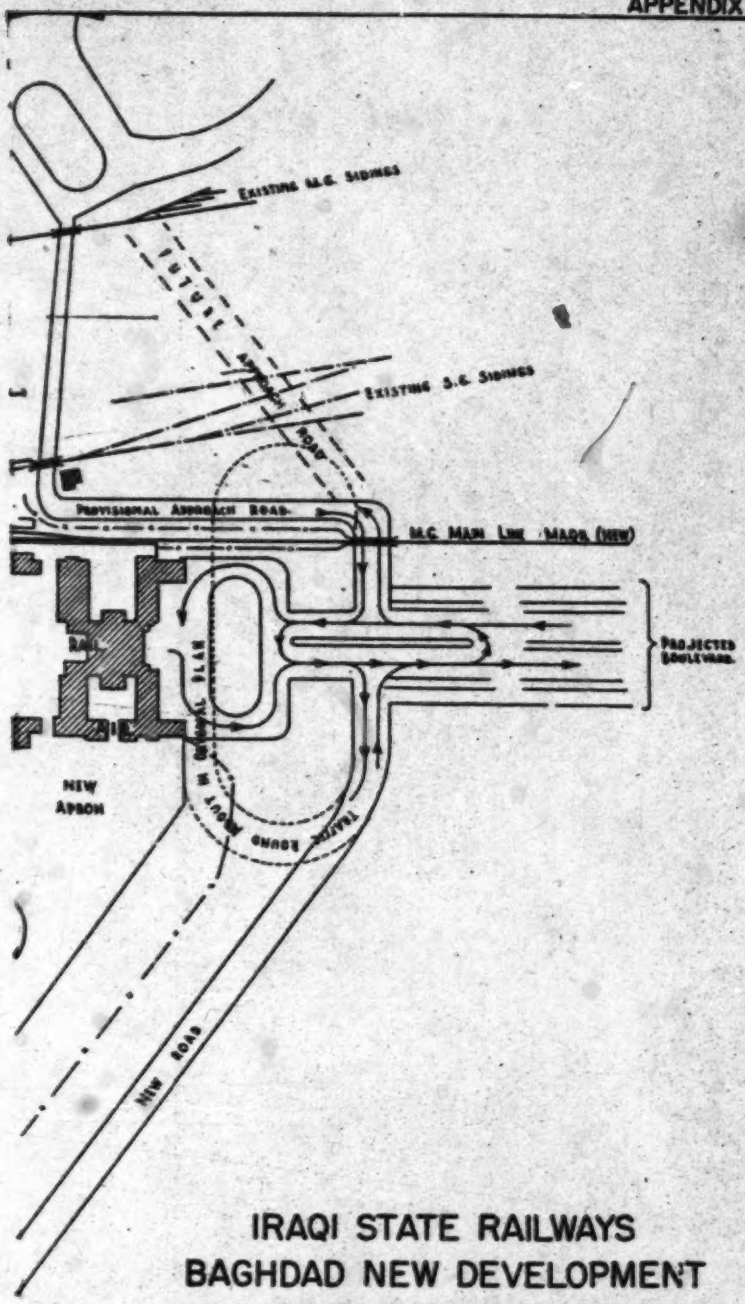

IRAQI STATE RAILWAYS
BAGHDAD NEW DEVELOPMENT
SIMPLIFIED STAGE I

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APPENDIX C

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Additional Railway Projects

1. Railroad bridge across Tigris at Baghdad—completed and financed.
2. Kirkuk-Erbil line—ID 100,000 required of which ID 85,000 for land already occupied.
3. Musayib bridge—ID 3,500 for land occupied, but not yet paid for.
4. Machinery for workshop—ID 11,000 for installation of plant already purchased and paid for.
5. Railway station and headquarters—ID 143,000 commitment plus ID 100,000 for provisional plan.
6. Rolling stock—no allocation required.
7. Crane—no allocation required.
8. Labor quarters—ID 341,000 required to be spread over three to four years.
9. Signalling—ID 4,620 for installation of equipment already procured.
10. Workshop extension—completed.
11. Power house—ID 4,700 for installation of plant already procured.
12. Aircraft to be provided for under air transport allocations.
13. Construction of stations—not urgent.
14. Construction of officials' quarters—not urgent.
15. Army assets—completed.
16. Land already purchased for station extensions—ID 41,000 for two years.
17. Shamiya station—scheme abandoned.
18. Electric plant—ID 12,000 for installation of plant already procured.
19. Accounting machines—ID 20,000.

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20. Electric plant—ID 6,050 for installation of plant already procured.
21. Permanent way—ID 5,000 for installation of plant already procured.
22. Weighbridges—ID 5,900 for installation of plant already procured.

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APPENDIX D

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Notes on Conversion from Meter to Standard Gauge of the Basra-Baghdad-Erbil Main Line and Branches

The conversion plan, if carried out, should establish an approximate D-day of conversion for the Basra-Baghdad line five years ahead and a second D-day of conversion for the Baghdad-Erbil line in the following year, i.e. in six years' time.

As a preliminary step there should be a careful survey of the number of tracks in yards, loops and sidings in stations which are unused or in excess of requirements, so that the conversion can be concentrated on tracks and sidings truly necessary. The conversion mileage can thereupon be determined.

A further preliminary step would involve a study of revised timetables, which take account of the new form of traction and the reduction in motive power units and rolling stock resulting therefrom.

The conversion will require the substitution of standard-gauge sleepers for the entire length of track to be converted from meter gauge. On certain sections this will involve broadening of the existing earth or stone ballast bed. On some bridges slight structural alterations to longitudinal girders may also be necessary. No other substitution or expansion is required for the conversion since any strengthening of the track by new rails, new turnouts, stone ballast or earth, etc., should properly be considered a replacement or development requirement, not a conversion requirement.

The conversion will also require the substitution of standard-gauge rolling stock for existing meter-gauge stock. New diesel locomotives will in any case be required by the change-over to diesel traction, and since carriage and wagon bodies have been built to standard-gauge dimension, the only change rolling stock conversions will require is the substitution of standard-gauge undercarriages for the existing meter-gauge. Any replacement, renewal or expansion of rolling stock carried out at the same time should be considered, therefore, a development rather than a conversion requirement.

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The raising of platforms and loading bank levels may be considered a conversion requirement, but it is not an essential part of conversion, and it may, in most stations, be postponed or even dispensed with. Buildings, fencing, signalling, communications system, water supply, power plant and machinery are, for the most part, not directly affected by the conversion. To the limited extent that they may be affected, as in the case of machinery and stores, there is a reduction, rather than an expansion, involved. 496

The two D-days for conversion should be determined inside two successive years' seasons of low traffic. The conversion program before and on D-day, and the completion program after D-day are scheduled in outline in the following paragraphs.

Standard-gauge sleepers in the existing track scheduled for conversion after the survey prescribed earlier should be substituted for meter-gauge sleepers, over as long a period as practicable, well in advance of D-day. This can be done by the ordinary maintenance gangs, strengthened where required, in slack periods.

Special gangs or contractors, or both, should proceed to put out of service approximately half the number of sidings in the yards and wharves, etc., at Magil and Baghdad, and at the most important intermediate stations bring these to standard gauge. At each crossing station which has more than one crossing loop, one or more loops would be put out of service and similarly converted, including the turn-outs at either end, in or by the side of the track.

If agreement is reached on remodelling of the yards in Baghdad-West, the new yards will need to be built for standard gauge, leaving the abandonment of the meter-gauge yards until after the conversion.

Some days before D-day a proportion of the rail fastenings in the remaining track would be loosened, and key turnouts at entrances and exits to stations and yards built at the side of their final position.

On D-day the conversion would be carried out with might and main over the entire length of the line, joining the already converted halves of yards and at least one loop at crossing stations, all within an allowed space of not more than 24 hours.

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The special gangs and contractors would then continue to convert the remaining halves of yards and loops and remove surplus sidings.

Rolling stock and locomotive requirements will have to be met as follows:

1. **Motive power.** Diesel engine types will have to be ordered forthwith for standard-gauge trial. After a suitable period of trials under all conditions and circumstances, including try-out of alterations resulting from the trials, the order for the full requirements must be placed so that delivery of the absolutely essential number of units can be made before the two D-days of conversion.

2. **New rolling stock.** No new rolling stock for meter-gauge lines should be ordered from the day the conversion is decided upon, and new units of coaching stock and wagons which would have been ordered under the meter-gauge renewal program will need to be ordered for standard gauge. The number should be increased so as to cover a renewal program of 10 years concentrated in a period of five years.

3. **Conversion of old rolling stock.** With due regard to the reduced number of coaching and wagon units as calculated by the preliminary survey, any deficiency remaining after the provisions outlined under paragraph 2, will have to be met by rebuilding of meter-gauge to standard-gauge stock from existing bodies on new undercarriages.

New standard-gauge rolling stock imported through Basra port should be held at Basra on the converted portions of wharves and yards in readiness for operation from D-day. Converted stock, handled at Baghdad workshops, plus the surplus now existing on the standard-gauge line, is to be similarly held ready at the Baghdad end.

Traffic must be interrupted for a few days before D-day, probably three days or less in the down direction and one day in the up direction. These days must be used to bring all meter-gauge stock, except the units to be sold or scrapped, under load or empty from Magil to Baghdad for use on the Erbil line. All units to be sold must be brought to Magil before D-day. This process will already have started several weeks before by a judiciously planned distribution operation. Both the public and the trade must be warned in advance so that traffic, though interrupted for a few days, need not suffer.

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The same procedures, on a far smaller scale, would be repeated a year later on the Baghdad-Erbil line. In the planning arrangements outlined above the estimates of costs may be calculated in considerable detail.

The cost of conversion of track and accessories will consist of (1) the actual cost of labor, materials and supervisions involved in the operation of 800-plus miles of standard-gauge sleepers, less the cost of 10 years' replacement of meter-gauge sleepers and the scrap value of removed meter-gauge sleepers, and (2) the cost of widened earth or ballast section and of some structural alterations to bridges. The difference in cost between the 75-pound rails required for standard gauge and the 60-pound rails that would otherwise be used for renewals might also be included, although this item is not a real conversion cost. There is no doubt that developments in any case would demand heavier rail than 60-pounds even if the meter gauge is retained.

The conversion cost in terms of motive power and rolling stock will consist of (1) the difference in cost of standard-gauge and meter-gauge diesel locomotives; (2) the difference in cost of standard-gauge and meter-gauge coaching stock and wagons scheduled for renewal; and (3) the cost of extra standard-gauge rolling stock required to reach the numbers necessary for operation.

From the costs so calculated must be deducted the saving in new procurement resulting from the smaller numbers of locomotives, carriages and wagons as standard-gauge and former meter-gauge stocks are pooled. The resulting savings in maintenance and renewal costs will accrue over a period of 15 to 30 years during which old stock will be completely replaced by new stock.

Finally an attempt should be made to assess in some detail the savings in operation, maintenance, warehouses, stores and administration generally resulting from the conversion; also the saving in transshipment costs plus the increase in revenues from the larger traffic which will undoubtedly develop once transshipment has been abolished.

One further factor will affect the cost of rolling stock. Standard-gauge wagon stock should comply with the requirements of the European Wagons Union (RIV) but the designs should follow the existing simple standards of meter-gauge rolling stock.

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496 The wagons of most European railways, including the present standard-gauge wagon stock of Iraq State Railways, are unnecessarily luxurious and far too heavy for Iraq's needs. The railways' traffic consists largely of smaller than bogie load consignments, and the four-wheeled wagon type should be retained in preference to a switch to bogies stock.

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ANNEX F

PUBLIC HEALTH

I. Introduction

Extent of Progress Made in Public Health

In the past 30 years health services in Iraq have improved considerably. In 1918 the country had only one hospital, contrasted with the present 89 hospitals (4,812 in-patient beds or one bed per 1,000 people) and 448 dispensaries. Control measures including the use of vaccines, particularly for smallpox, have cut down the incidence of epidemics during the last few years. Cholera has not occurred since 1931 and the plague not since 1935. Smallpox and louse-borne typhus also seem to be under control. An Institute of Endemic Diseases has been set up with headquarters in Baghdad. Steps have already been taken to control malaria and a good deal of information is being assembled on schistosomiasis (bilharzia) and ankylostomiasis. Nevertheless, the main endemic diseases—malaria, schistosomiasis, trachoma, and ankylostomiasis—are still very common.

In 1949 there were 797 doctors practicing in Iraq, of whom 419 or 53 percent were in Baghdad. There were about 387 government pharmacies and 252 pharmacists working in private pharmacies in the larger towns.

The doctors are supplemented by 265 health officials, originally trained primarily to staff village dispensaries, and 400 nurses and 659 dressers (male hospital attendants), about one to every four or five hospital beds. There are also private nurses, midwives and dressers, and 130 public vaccinators who are employed on a permanent basis. In 1948 and 1949, 3,061,955 and 2,080,777 smallpox vaccinations were made (the 1947 census showing a total population of 4,799,500).

Malaria, trachoma and bronchitis were the main hospital cases; the dysenteries, anemias, wounds, syphilis and phthisis were

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also frequent causes for hospitalization. In 1949 there were 5,876,336 visits to health institutions for treatment.

Public Health Budget

In 1951-52, ID 2,089,180 (7.6 percent of the total budget) were allocated to health services, as compared to ID 187,672 in 1931. Because of the prevalence of endemic diseases and the constant danger of epidemics, it would not be unreasonable to spend 10 percent of the total budget on health services.

Salaries for personnel in the medical service appear to be low in relation to the cost of living, although they are not low compared to other civil service salaries. The basic salaries, exclusive of cost-of-living allowances, range from ID 5.15 a month for a dresser, to ID 25 for a doctor and ID 80 for a director-general.

Current Health Conditions

In spite of the undeniable progress in health conditions, there is need for further improvement. Definitive data are lacking on total birth and death rates, but some figures are available on the infant mortality rate, which is probably the best index of the social circumstances of an area. For Baghdad, the recorded rate in 1949 was 128 deaths per thousand births. Iraqi doctors who have worked in different parts of the country consider the rate to be about 250 per thousand, on the average, compared with about 34 deaths per thousand live births in highly developed countries.

Among the people as a whole, malaria seems to be the chief killer, especially in country districts. In the main cities the leading causes of deaths were intestinal diseases, tuberculosis and respiratory diseases. These diseases and trachoma seriously affect the ability of men and women to work efficiently and are among the major causes of low productivity of labor in Iraq. For example, candidates for the police service are frequently rejected because of defective eyesight and what is characterized as "poor physique" associated with chronic malaria, schistosomiasis, etc. About 20 percent of the young men liable for military service are found to be unfit.

Heart trouble, cancer and other organic disturbances are far outnumbered by diseases which are essentially social in origin. Most of them can be traced to lack of hygiene, poor sanitation and

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congested living conditions combined with a coarse and monotonous diet.

In common with many other countries, there has been a drift to the towns, and unsanitary slums have formed on the outskirts of some cities. Steps should be taken to improve the living conditions of these slum dwellers. So far sewers and sewage disposal are generally lacking in the cities and towns. Baghdad has septic tanks and cesspools, but there are still some open drains; most of the larger towns have similar systems of sewage disposal but conditions in the smaller towns and villages are still very primitive. The disposal of household refuse and the cleaning of streets are generally well carried out in the bigger cities but not in most towns and villages.

Constant pilgrimage traffic creates another problem in public health. The holy shrines of the Shia sect of Moslems are in Iraq and a large number of Iraqis are members of this sect. There is a continuous stream of travelers through the country, including both Iraqis and foreigners, mostly Iranians, visiting the holy shrines, and Iraqi and foreign pilgrims on their way to Mecca. All this traffic exposes Iraq to the dangers of imported epidemic disease and stringent quarantine regulations have been enacted. But the land frontier with Iran is so long that it is quite certain many incoming pilgrims never are subjected to any control measures. This means that Iraq needs internal preventive services of the highest possible standard. Currently, all pilgrims leaving Iraq for Mecca are vaccinated against smallpox and inoculated against cholera.

The need for greater emphasis on preventive measures stands out clearly in even a brief analysis of the most debilitating diseases and their causes.

Intestinal Disorders

Ankylostomiasis (hookworm disease) in itself produces anemia. Many patients are so weak by the time they reach a hospital that they require lengthy treatment. It thrives in an unsanitary environment characterized by inadequate sewage disposal, open drains, and lack of proper latrines. Incomplete surveys indicate that it is most prevalent in the South.

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164 *Ascaris*, caused by round worms living in the intestinal tract, is found particularly in the North. Sewage disposal is the worst offender in this case; the custom of using the contents of cesspools as manure for vegetables is probably among the chief factors in spreading the disease.

In the case of the *dysenteries*, the incidence has been correlated with fly-breeding seasons, and is thus generally lower in winter and in August and September. Many Iraqi doctors maintain there are now fewer cases of dysentery in those cities in which pure water supply systems have been installed.

Unlike dysentery and typhoid fever, *enteritis*—common throughout the land and particularly among infants—is, in the opinion of Iraqi doctors, as common as it ever was in spite of some sanitary improvements in the cities.

Malaria

The desert climate prevailing over the greater part of the country is not in itself conducive to the breeding of mosquitoes. Man-made conditions, specifically irrigation projects, are largely responsible for the breeding of the disease-carrying mosquitoes, especially in the central plains where they thrive in seepage water, open pools and the small irrigation channels of the date palm gardens. There can be no doubt that every year malaria causes many deaths (estimated by Iraqi doctors at 50,000 a year), much sickness and permanent disability and, consequently, immense loss to the country. It must also be remembered that malaria is commonly associated with schistosomiasis (carried by the snail thriving in polluted water) and ankylostomiasis, causing widespread anemia and debility. Malaria is therefore of profound significance to the economy of Iraq.

Tuberculosis

Although the total population is not large, many parts of the country are, even in the villages, densely populated. In a poor district of Baghdad and in many villages an average of 4.5 persons live in one room. Iraqi doctors are generally of the opinion that tuberculosis is increasing in the country although there are no

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reliable figures on its true incidence. One real problem is that the public has come to regard tuberculosis as a shameful disease so that few people report to hospitals in the early stage of the illness. The government has applied to the World Health Organization for assistance in dealing with tuberculosis. It is understood that WHO will send a team consisting of a consultant, an epidemiologist, a bacteriologist and two nurses to begin a BCG campaign; and that, by arrangement with UNICEF, they will be assisted by two medical officers, two nurses, and one administrator. The government will build a suitable "chest center" in Baghdad where the WHO team will work and where local staff can be trained.

Eye Diseases

Eye diseases are common in Iraq, as in the rest of the Middle East. It has been estimated that there are 40,000 totally blind persons, most of whom cannot work and must be cared for, thereby becoming a burden to the community. About one in five of the total population have been treated annually for conjunctivitis or trachoma in the past six years. To a large extent these also are social diseases, although some doctors in Iraq think certain eye diseases may have a nutritional basis in the consumption of large quantities of polished rice.

II. The Curative Services

Hospitals and Dispensaries

In general, the curative services have received more attention than preventive medicine. Iraq's 89 hospitals are unevenly distributed, however, since one third of them are in the Baghdad area and the remaining 59 are divided among the other 13 provinces. It is true, of course, that there is higher concentration of people in Baghdad.

Of the 89 hospitals, 58 are general and six are for infectious diseases, three for eye diseases, two for venereal diseases and one for lepers. There are also two hospitals for children, one for

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743 women and children and one for mental dieases. A new tuberculosis hospital and sanitarium has just been opened in Baghdad. The Army, Railways, Port of Basra, Police, Ministry of Education, and the oil companies maintain their own hospitals. There is also an American Mission hospital.

While some hospitals are adequately equipped and staffed, many of them are seriously in need of repair and equipment, especially dental equipment. Most of the hospitals suffer from an acute shortage of trained subordinate staff (medical aides or nurses). Hygienic conditions in some leave much to be desired. Hospital administration appears to be weak throughout the country, with a few notable exceptions such as the Royal Hospital in Baghdad. This is the teaching hospital of the Royal Medical Faculty and has practically all modern medical facilities. Several Iraqi doctors are now attending a course on hospital administration in foreign countries, but so far the number attending these courses is small. It would be desirable to give such a course in Iraq to young doctors after qualifying.

Simple conditions are treated in dispensaries of which there are 448—403 of them government institutions—fairly evenly distributed throughout the country. The physical facilities and staffs of such dispensaries vary widely. Some are in the charge of a doctor but the majority are run by health officials and dressers. Except for vaccination against smallpox, the dispensaries do very little preventive medical work. Since there is only about one dispensary to every 12,000 of the population, it is obvious that the number must be increased as additional staff can be trained.

654 743 The Development Board has planned an annual expenditure of ID 700,000 on medical service buildings in its five-year program extending over the period 1951-52 to 1955-56. A detailed breakdown of this expenditure was available only for the first year. On the whole the total outlay envisaged over the entire period would seem adequate. In the first instance, however, efforts should be concentrated on the replacement, repair and modernization of existing hospitals. In addition to the projects of this nature for which provision was made in the first budget of the Development Board, the following would appear to be most urgent:

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Additional provision for reconstruction of the Karkh and Kut Hospitals	ID	200,000
Repairs to the Maude Hospital (Basra), Amara Hospital, Erbil Hospital and Suleimaniya Hospital		250,000
Infectious disease blocks for the Erbil and Mosul Hospitals		65,000
Maternity block for the Hilla Hospital		25,000
Laundry for Diwaniya Hospital		12,000
Additional wards for Mosul and Kirkuk Hospitals		80,000
Completion of Mental Diseases Hospital		250,000
Additional provision for operating facilities at Royal Hospital		50,000
Children's Ward at Royal Hospital		40,000
Maternity block at Royal Hospital		40,000
Dental equipment for hospitals		20,000
Total	ID	1,032,000

As it becomes possible to devote more attention to increasing facilities for treatment, priority should be given generally to the construction of additional dispensaries in the rural areas.

Doctors

At present there is about one practicing doctor to every 7,000 of the population, but many of the doctors are concentrated in Baghdad. Only about 35 doctors are now being registered annually, but with increased accommodations and more laboratory facilities, it will be possible to enroll more students so that at least 50 will qualify as doctors annually. This number may be sufficient for Iraq's needs, provided that an adequate number of suitably trained health officers are available for service in village dispensaries and that nurses and dressers receive more training.

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Doctors receive their training at the Royal Faculty of Medicine, which was founded in 1927. The syllabus and teaching seem, on the whole, to be good. They emphasize adequately the study of the endemic diseases, although they do not give enough weight to the teaching of public health and preventive medicine. The recent appointment of a professor of public health should give a better balance to the program of instruction. Public health as such should probably be taught as a postgraduate course. It would include such subjects as public health administration, public he-

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legislation, water supplies, removal and treatment of waste matter, industrial health, and maternity and child welfare. In the qualifying course it would best be taught as social medicine which might be defined as "the study of those environmental factors which affect health, and the application of that study to the benefit of man with a view to the prevention of disease and promotion of health."

There appears to be an excessive trend towards specialization. In some hospitals specialists have been appointed where there is clearly not enough specialized work for them. Though specialization should by no means be overlooked, a specialist service must depend first upon an adequate supply of general practitioners. Probably the four most needed types of doctors, in addition to physicians, are surgeons, eye specialists, gynecologists and obstetricians.

One of the more urgent requirements is to attract doctors to the provinces. Iraqi doctors have shown little inclination so far to work in villages, partly for financial reasons but not a little because of the great lack of amenities in rural areas. There are no suitable houses for the doctors and their families, few schools, and in many places neither lighting nor a pure water supply. Young doctors who have been trained to require and depend upon all the latest technical aids in diagnosis and to insist upon the use of the most modern forms of treatment generally find that in most villages they cannot practice the medicine they were taught. If the best use is to be made of the doctors available, as much emphasis must be put on improving village facilities as on training doctors for the provinces.

Medical Aides

The acute shortage of trained aides is almost more serious than the shortage of doctors. In one hospital there were 21 doctors but only 12 trained nurses. There is a general lack of specially trained laboratory assistants, operating room attendants, radiographers, hospital storekeepers or hospital dispensers, and the like. Health officials, trained primarily for service in village dispensaries, are frequently diverted to hospitals to act as special "medical auxiliaries".

In all, there are about 1,000 nurses and dressers for some 5,000 hospital beds. Trained nurses are few in number so that

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standards of nursing are not high. However, the three-year nursing course given at the Royal Hospital is comprehensive and includes all the common branches of nursing.

Unfortunately in Iraq, as in many other Moslem countries, nursing is not at present looked upon as a suitable career for Moslem girls of good family. Probably one of the best means of inducing girls to take up nursing is to demonstrate through the employment of foreign nursing sisters that nursing is regarded abroad as a highly qualified and reputable profession. More women might also be attracted to this profession if they were given suitable living quarters and accorded a position in the government service equivalent to that of elementary school teachers.

The one central nursing school in Baghdad will not supply the needs of the country. Since many young girls will not leave their homes to go to school, it will be necessary to set up local schools for nurses and also for dressers. Training for practical nurses should be started at Basra, Mosul and Karkh hospitals and eventually every province should have such a school. Candidates should have had at least six years of preliminary schooling and the course itself should last a year. It is suggested that two foreign nursing sisters, preferably English-speaking, be appointed to each province to act as nursing supervisor in the chief hospitals and as "principal" of the local nursing schools. It would also be desirable to assign to each school a sister-tutor—a graduate of the central school.

At the same time, nursing supervision needs strengthening in the Royal Hospital where at present there are only three foreign nursing sisters for 680 beds. For efficient operation the Royal Hospital needs the following foreign nursing sisters:

1. One matron
2. One assistant matron
3. One sister tutor
4. One sister for the maternity block
5. One for the children's wards
6. One for infectious diseases hospital, and
7. Two for general duties.

It is most important that every foreign nursing sister should get to know, as quickly as possible, something of the language, mode of life and habits of the people.

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An estimate of the cost of the full scheme follows:

(a)	CAPITAL	
	(1) Quarters for women nurses	ID 125,000
	(2) Demonstration rooms	28,000
	(3) Quarters for foreign sisters[1]	80,000
	(4) Equipment, etc.	7,000
		ID 240,000
(b)	RECURRENT	
	Salaries for foreign sisters (only)	ID 37,000

Training schools are also necessary for hospital storekeepers, laboratory assistants, radiographers and probably for physiotherapists and dispensers. Storekeepers should be appointed to every hospital to preserve equipment and to check the use of expendable items. Dressers, who are already familiar with the names of many articles used in hospital work, would probably be the most suitable candidates for training. The schools could be started with the existing staff and facilities of the Royal Hospital and of the Central Medical Stores, and as each trained group is ready to go to work an appropriate pay scale ought to be established for them.

Pharmacists and Medical Supplies

A School of Pharmacy and Chemistry was founded in 1936. The five-year pharmacy course is comprehensive and the facilities for teaching, including laboratories, are good.

So far 218 pharmacists have qualified from the school but many have gone into private work and only 64 remain in government service. Apparently the salary paid to a pharmacist working in a private shop is at least twice as high as that paid by the government. Further, a number of qualified pharmacists have recently left the country. With the existing accommodations the school can graduate about 20 pharmacists annually. Meanwhile there are only 64 pharmacists working in the 89 hospitals and in some hospitals the dispensing, including that of poisons, appears to be carried out entirely by health officials.

[1] It is estimated that 37 foreign nursing sisters would be required: 27 for the 14 provinces (there is already one in Basra); five for the Royal Hospital at Baghdad; and five additional for replacements during sickness and leave.

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Pharmacists are licensed by the Director General of Health. An Inspector of Pharmacies inspects private pharmacies, although it would appear reasonable to place the supervision of these pharmacies more directly under the local chief medical officer.

Certain drugs, such as the anti-biotics and sulphonamides, are supplied in most countries only on a doctor's prescription. In Iraq, however, these drugs can be freely obtained at any pharmacy. Hospitals at times suffer from a shortage of drugs owing to the limited funds made available by the government. Thus patients admitted to hospitals sometimes have had to buy drugs for themselves from pharmacies in the towns. It is to be hoped that future budgetary provisions will be sufficient to supply hospitals with the drugs necessary for their work.

Under the present system, local hospitals send their requisitions to the Director General of Health, through the chief medical officer of the province. These requisitions are scrutinized by the Director of Supplies, who passes them on to the Director General of Health for authority to issue the supplies required. The issues are then made direct to the hospital concerned. It seems that most medical supplies—although by no means all—are purchased from the Crown Agents of the British Government. The central supplies are kept in Baghdad in what seems to be an orderly and well-run department. There is at present some congestion in the drugs and dressings section, and new buildings are required to provide adequate space for the many items stocked.

Because Iraq is a country of great distances with many scattered villages and hamlets, during certain seasons of the year small communities may be cut off from medical aid by snow, rain and mud. It is not possible to place hospitals and dispensaries within easy and certain reach of all people throughout the year. There are, however, many simple household remedies such as the anti-malarial drugs, aspirin, DDT powder, iodine and Epsom salts that could be put up in suitable packages with full directions for use. It is suggested that the government package such remedies for sale in village shops at a price within reach of the local people.

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III. The Preventive Services

744 While the curative services have developed rapidly, measures for the prevention of disease and the promotion of good health have not kept pace. There is a general appreciation among doctors—both senior and junior—as well as among responsible laymen that the time has come when greater emphasis should be placed on the need for preventive medicine and public health measures. However, there are as yet no Iraqi doctors who have received the special training necessary and who have had the opportunity to gain the experience required to organize and develop these services.

Although public health, as a subject, has been taught in the Royal Faculty of Medicine, there has apparently always been a leaning towards clinical medicine. Present conditions in the medical service do not encourage doctors to devote themselves to public health work. The low salaries paid and the permission to practice privately after government working hours encourage doctors to favor clinical medicine and to specialize if possible. Consequently the villages have been neglected and there is keen competition to work in the larger cities. A recent reorganization in the Ministry of Social Affairs, setting up special divisions for public health and social services in the towns and villages, was designed to promote and develop preventive measures. The first requirement, however, is a trained staff to carry out the work.

Among the measures which might be taken to strengthen the preventive services the following should be emphasized.

Organization of a Sanitation Corps

At present the health inspectors of towns are essentially sanitation orderlies who have learned something by apprenticeship and experience. Many of them work in hospitals to the detriment of the sanitation and public health side of their work. For the future Iraq needs three types of sanitation officers: house-to-house inspectors, sanitation overseers and sanitation inspectors. The sanitary condition of the towns is likely to remain unsatisfactory until some form of house-to-house inspection can be started, aimed

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chiefly at the prevention of mosquito and fly breeding and the cleaning up of conspicuously unsanitary conditions.

House-to-house inspectors are necessary only in towns with a population of over 25,000, which means some 250 inspectors would be required. The 134 health inspectors already employed could form the nucleus of this group and it should not be difficult to find recruits with at least elementary school training.

The *sanitation overseers* would supervise the work of the house-to-house group and would also undertake a wider range of sanitary inspection, including restaurants, foodstuffs supplies, etc. Probably 100 overseers would be enough, and a one-year course should be sufficient to train men for the job. Candidates for training should be drawn, as far as possible, from the ranks of the house-to-house inspectors.

A number of *sanitation inspectors,* about 50 in all, would be required to take charge of districts, to supervise the work of sanitation overseers and the house-to-house inspectors, and to advise on all matters concerned with environmental hygiene in their districts. Candidates for this job would need a sound, general education (i.e. completion of the full intermediate school course) and would require not less than two years of training which would include practical sanitation work of all sorts. Training schools for these inspectors should be set up by a foreign sanitation expert, preferably one with knowledge of and experience in the Middle East. Some buildings will also be necessary, at an estimated capital cost of about ID 10,000.[2]

Training of Midwives

Midwives, who by the nature of their work have free entry into village homes, are among the most important potential health workers. It is they who can give acceptable advice in the home and consequently they could do a great deal to improve health conditions in the villages. Although 803 midwives are licensed to practice, scarcely any of them in either cities or villages have

[2] The recurrent cost of operating the school would be about ID 2,000 yearly. The recurrent cost of the sanitation service when fully organized might be approximately ID 75,000 annually.

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844 received training of any sort. In Baghdad there is a government maternity home but it has had very little to do with the practicing midwives.

It is presently estimated that 900 midwives are needed in the villages, 300 in the towns and 80 in the hospitals. In order to take into account the great difference between conditions in the towns and villages, it would be desirable to institute two courses of training:

1. A ~~one-year~~ course for literate girls and women who will become midwives in urban populations and fill government posts; and—
2. A course lasting approximately six months for illiterate (or largely so) practicing midwives who, after training, will return to their own villages.

A few Iraqi women have taken a course in midwifery outside of Iraq and these women, together with three foreign midwives, could serve as the teaching staff at the outset.

An estimate of the staff and buildings required and their cost follows:

(*a*) School for Town Midwives:
1. Staff: three staff midwives, one director, cook, etc.
2. Buildings: quarters for 20 pupils, 10 maternity beds, etc.
3. Capital cost: ID 40,500

Output—20 trained midwives a year.

(*b*) School for Village Midwives:
1. Staff: three staff midwives, one director, cook, etc.
2. Buildings: quarters for 15 pupils, six maternity beds, etc.
3. Capital cost: ID 31,500

Output—30 village midwives annually.

(*c*) One Principal for the Schools

Establishment of Village Health Centers

743 Iraq is a country of scattered villages and hamlets and of great distances; to bring medical aid, however simple, to the greatest possible number of people it would seem wise to increase the number of dispensaries as staff becomes available. It might even be possible to attach some mobile dispensaries to the larger sections of the nomadic tribes.

The village dispensary should become a center for all health activities in the area. Not only should the health official (or medi-

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cal assistant) treat simple conditions—and he could well treat 743
cases of most of the major endemic diseases—but he should also be the village "sanitarian". The village midwives should be based at the health center and draw their supplies there. Vaccination against smallpox—of prime importance in Iraq—and other protective innoculations could, as required, be carried out in the centers. Later, public health nurses could be added to the center staffs.

The number of health centers must necessarily depend, among other things, upon local population density, distances and means of communication. Visiting doctors from the hospital to which the center is attached could call at regular intervals to see special cases referred to them by the health official. By such means as these, medical assistance and advice could be brought within reach of most of the people and the best use be made of the doctor's services. At present the district or *qadha* doctors have no means [758]
of transport to visit dispensaries.

The additional health officials who would staff these centers could be selected from among the hospital dressers. Since these men have already had considerable clinical experience, it should be possible to train them in about a year. Because they are much closer to the village people than the visiting doctors, they can do a great deal to help the local people. One Iraqi doctor stated that an experienced and happy health official can do better work in a village than an unhappy and disgruntled newly-qualified doctor.

There are about 400 dispensaries at present, some of which are staffed only by dressers. Assuming 20 medical assistants can be trained annually, it should be possible to staff all the present dispensaries and 200 new ones with medical assistants in less than 20 years. The buildings and staff now used by the School for Health Officials (founded in 1932) could equally well be used as a training school for medical assistants.

Training of Public Health Nurses

As soon as some midwives have been trained, a program 744
should be started for the training of public health nurses. These women would hold positions of considerable responsibility, and every candidate for the course should already be a trained nurse and a midwife.

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Expansion of Health Education

565 511 751 Iraq has a small, wealthy upper class and a small middle class. The great majority of the people are poor and ignorant, most especially in regard to health measures. Health education is badly needed and there is no doubt that the people would respond readily to teaching. Large groups enthusiastically attended all the shows put on for the health week held in Diwaniya province; competitions for the best eating-house, butcher's shop and barber's shop were keenly contested and visitors thronged to see the model house and the medical exhibition. The oil company in Kirkuk employs a British sanitary inspector and the Railways Administration in Baghdad recently sent their Iraqi sanitary inspector to take a course of study in the United Kingdom. The response of the householders in these places to sanitary measures is striking; their pride in their homes is obvious and the absence of flies conspicuous.

751 871 To begin with, every doctor should have a thorough understanding of the relation of environmental factors to disease. Greater emphasis on the teaching of preventive medicine and particularly of social medicine in the medical school, as has already been recommended, would help to inculcate a wider appreciation of the importance of the preventive outlook in all medical work. Like doctors, nurses have a unique opportunity to teach their patients, and personal and domestic hygiene should take their proper place in the training courses for nurses. Every hospital should be an object lesson in hygiene and every patient should learn by his stay in it.

Health education must be given an important place in the curriculum of the teachers' training schools, and special courses in the prevention of the diseases associated with irrigation and cultivation should be included in the syllabus of the School of Agriculture and of the School of Engineering.

Hygiene is already taught in the schools but ought to be given greater emphasis. Personal hygiene is essentially a matter of habit formation and young school children should be trained in good habits as a daily routine. Special classes could be given in the prevention of the main endemic diseases—possibly, in some cases, by the school medical officer. It is for the Health Department to

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decide what should be taught and then the educators can decide how it should be taught. 751 871

In the villages, the school buildings could sometimes serve as models for house-building; in any case, every school should in itself be a lesson in hygiene. Well-balanced meals are provided in the boarding schools and serve as examples for the home. Possibly the elder girls could be taught some "mothercraft", the treatment of minor ailments (cuts, abrasions, etc.), some sewing and also some domestic economy.

At present the *School Medical Service* is administered by the Ministry of Education and has a staff of 20 doctors and four dentists. In the school year 1949-50, 147,084 pupils were examined revealing splenomegaly among two percent, schistosomiasis in five percent, and trachoma in 25 percent, while 40,767 attendances were made for dental treatments. To carry out an effective program for treatment of trachoma, more school nurses will be needed.

There are several *other groups* through which health education can be disseminated. Police training schools and prisons, including reformatories, offer good opportunities for teaching health. The Central Prison in Baghdad is a good example of cleanliness and orderliness. The Army should teach in its officer training courses that the promotion and maintenance of the health of an officer's unit is his first duty. 697 751 702

A few voluntary societies are now undertaking some health education, but the scope of their work could be greatly increased, particularly in maternal and child welfare and in the prevention of tuberculosis. Special pronouncements could be prepared by religious societies for reading in the mosques (e.g. against the pollution of water supplies as a measure to limit the spread of schistosomiasis). Simple health notes written in the vernacular would be of help where a local newspaper is published. Short talks could be given from the national broadcasting station. 751

There is a great opportunity for health teaching in the projected new settlements. The staff required for such work are medical assistants, sanitary overseers, midwives and possibly public health nurses who, after having received appropriate training, will work in and from one or more village health centers.

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The most important links with the people are, of course, those who belong to them and who work among them: that is, the dispensary *medical assistants* and *midwives* in villages and the midwives and public health nurses in the towns. *Maternal and child welfare centers* in towns could also provide health education. There are already a few centers operating in Baghdad but there is a great need to open more centers throughout the country as soon as trained staff are available. The proposed house-to-house inspectors, sanitary overseers and sanitary inspectors could all be most valuable teachers.

There is no doubt that *health weeks* would stimulate great interest and health exhibits could be included in agricultural and other shows (e.g. to display measures designed to prevent the spread of malaria, schistosomiasis, etc.). Travelling vans giving film shows might also be of some use.

Elected *public health committees* of the village elders, advised by the medical assistant or visiting doctor, might do much to improve conditions in villages. *Mobile dispensaries* should include in their staff a sanitary inspector and a health visitor (public health nurse) who could go round the village while the doctor is seeing patients.

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It should be noted that the government plans to inaugurate a rural health center at Abu Ghuraib, which is designed to provide curative and preventive services for the population of the area and at the same time serve as a practical field for training rural health workers, with particular emphasis on the control of communicable diseases and maternal and child health. It has requested advice from the World Health Organization on the planning and establishment of the center. Accordingly, in 1950, provision was made under the technical assistance budget of the World Health Organization for a rural health survey. Provision has been made under the 1952 technical assistance budget for one public health administrator with general experience in rural health, one epidemiologist, one sanitarian, and two public health nurses, one with general experience and one with the experience in midwifery. It is expected that the government will submit a request to UNICEF for appropriate supplies and equipment. At a later stage the program may be developed in cooperation with other specialized agencies.

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IV. Endemic Disease Prevention

One of the most important sectors of the entire public health program should be a well-planned attack on the leading endemic diseases, e.g. schistosomiasis, malaria and ankylostomiasis.

The need for better housing, sewage disposal systems and safe water supplies has already been mentioned. Measures to accomplish these improvements are discussed in detail in Annex H, on *Community Planning and Facilities.*

Schistosomiasis

It is clear from available records that at present relatively few persons suffering from schistosomiasis receive treatment. The Schistosomiasis Section of the Endemic Diseases Institute has carried out a survey which shows that the disease does not occur south of Basra and that, north of Basra, after reaching a peak in the Lakes Area, its incidence declines steadily up to the Kurdish mountains, where the disease does not occur at all. In Basra province the incidence reaches 23 percent, in Amara province 67 percent and in Baghdad province 35 percent.

Apart from its debilitating effects, the disease is complicated in a number of cases by bladder stones and calcification of the bladder. Associated as it commonly is with attacks of malaria and infestation with hookworms, schistosomiasis is of profound economic significance since it lowers the individual's capacity for work and his ability to overcome intercurrent infections.

The intermediate host is a snail which lives in stagnant water. Irrigation therefore provides conditions which may cause an increase in the prevalence of the disease, as has been shown in Egypt where schistosomiasis is a major public health problem. Investigations made up to the present indicate that the only fresh water snail which carries the disease in Iraq is the *Bulinus truncatus.* It does not appear to occur in either the Euphrates or the Tigris, or in streams in which water flows at a rate of three or more miles an hour. The cold winter weather inhibits the snail's activity and it is able to multiply freely only during the months of June and July.

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Spread of the disease[1] may be limited by:

1. Destruction of the snail through the use of copper sulphate (or other compounds) and the elimination of stagnant water. The rapid lowering of water levels will also destroy the snail by desiccation, and in irrigation canals a free flow of water makes conditions unsuitable for the snail.
2. Prevention of infection of the snail by the human host. This can be effected by treating the human carriers and by preventing the pollution of water.

In new irrigation projects it is strongly recommended that steps be taken:

1. To design major canals so that they maintain a flow of three miles an hour or more and minor distributory canals so that they dry out rapidly.
2. To site villages and canals, wherever possible, at a distance not less than a mile apart.
3. To provide villages with a separate, protected water supply so that water is not drawn by the inhabitants direct from canals. Where the underground water is unfit for use, water could be drawn from the closest canal by pipe and be passed through a simple filter. The filtered water (it could in some cases by chlorinated) could then be raised by "hydrohoist" or by semi-rotary pump into a gravity tank—if so required. Another important measure would be the installation of village baths.
4. To provide suitable village latrines, some of which should be on the side of the village towards the canal. Experiments should be made to test the feasibility of using pit or bore hole latrines. Public water supplies, baths, and latrines require, of course, attendants to keep them in order. Householders should install their own latrines.
5. To examine, as far as possible, the people who will live and work in the project. If necessary, they should be treated for schistosomiasis before irrigation begins.
6. To treat the canals and all collections of water that harbor the snail with copper sulphate twice a year.
7. To examine annually representative groups such as school children to determine whether the measures taken are effective.
8. To educate the people not to foul water and to promulgate regulations to provide for the protection of water from pollution.

[1] [SCHISTOSOMIASIS -- ANALYST.]

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Shitwi (winter) cultivation is, on account of the low temperature, far less likely to spread schistosomiasis than *saifi* (summer) cultivation. In considering any expansion of summer cultivation, therefore, the attendant health hazards should be carefully considered.

To carry out mass treatment of the people an expansion of the dispensary system is necessary together with the provision of mobile dispensaries. Initially four of these mobile dispensaries might be put into operation in the provinces having the highest incidence of schistosomiasis. The cost of each, including three motor vehicles, tents, 20 beds and supplies, would probably not exceed ID 5,000. In addition, an increase is required in the number of vehicles available to the Endemic Diseases Institute and provision must be made for an adequate and constant supply of copper salts.

Malaria

There can be no doubt that irrigation has been associated with a considerable increase in the malaria of the plains. Gravity or flow irrigation may lead to flooding of land or to seepage due to the faulty construction of canal banks. Water is precious where irrigation is carried out by lift and is not commonly wasted; consequently, flooding of land is rare. A third form of irrigation employed—namely that by natural inundation—is only seasonal.

Much work has been done in the Endemic Diseases Institute on studies of malaria in Iraq and also on the bionomics of the chief vectors of the disease. It has been discovered that in the North the mosquito *A. sacharovi* is associated with high endemicity. It breeds mostly in seepage water, open pools and in rice cultivation, and appears to be associated with sharp outbreaks of malaria when it descends occasionally into the plains.

In the South and spreading as far north as 34°N., *A. stephensi* breeds in similar conditions to those in which *A. sacharovi* develops in the North; it favors particularly water in small borrow pits, seepage water and the small irrigation channels of the date palm gardens. The *A. stephensi* mosquito is generally found in those areas where the level of the subsoil water is high. It is a highly efficient carrier of malaria and used to be found in the houses of Baghdad during the summer.

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Control measures include larvicidal treatment and the residual spraying of dwelling houses for the destruction of adult mosquitoes. In Basra, weeding of the small irrigation channels in the date gardens to promote the free flow of water is followed by the application of one percent DDT in oil and also by the spraying of the scattered huts at the fringe of the town. After the British Army left Iraq, there was a gradual but progressive relaxation of control measures which, coupled with the high river flood, culminated in a sharp outbreak in 1946. Spleen rates rose to 90 percent in some parts of the town but have since fallen rapidly with the reinstitution of control measures.

Measures designed to reduce the incidence of malaria include the following:

1. Expansion and extension of present control measures to insure:
   (a) An ample and constant supply of the various forms of DDT required.
   (b) An increase in the number of motor vehicles available to the Endemic Diseases Institute for its work.
   (c) An increase in special technical staff as rapidly as personnel can be trained.
2. Drainage in those areas where the level of the subsoil water is high in order to lower the level. Every proposed drainage scheme must, however, be carefully examined and judged on its merits. The drainage of established swamps is not likely to reduce the incidence of malaria; indeed, it may even increase it by providing suitable breeding places for dangerous mosquitos in drains. Amara province, for example, has extensive swamps but the mosquito breeding in them is predominantly the harmless *A. pulcherrimus* and the incidence of malaria is not high.
3. Expansion and extension of the village dispensary system, including mobile and movable dispensaries, to make treatment more freely available to the sick. The sale of antimalarial drugs in village shops would also help those living in hamlets remote from hospital and dispensary.
4. The approval of every new proposed irrigation scheme however large or small and whether government or private, by both the local and central medical authorities.
5. Comprehensive legislation, with effective means to enforce it, to insure the absence from irrigation schemes of conditions prejudicial to health.

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6. Well-trained sanitary staff in sufficient numbers to keep up a continuous inspection of irrigation schemes.
7. Recognition by officials of the Irrigation and Agriculture Departments of those conditions falling within the sphere of their own work that are prejudicial to health. They should also know how to remedy such conditions.
8. Cooperation of various departments. It is of primary importance that irrigation schemes be submitted for approval by the provincial administrative council, on which sits the chief medical officer.
9. The introduction of different crops or new methods of cultivation of existing crops which might have profound effects on the incidence of malaria. Possible examples are the substitution of potatoes for rice or the cultivation of "dry land" rice in the northern mountainous area.

It is understood that the government has sought advice from the World Health Organization on malaria control and that provision has been made under the technical assistance budget for one malariologist, one entomologist and one sanitation expert. The work is timed to begin in the second half of 1951 and to continue throughout 1952.

Ankylostomiasis

A good deal of work has been done in recent years to ascertain the prevalence and effects of hookworm disease. Improvements in sewage disposal, the closing of open drains, the provision of suitable latrines and the wearing of shoes are all measures that will assist in reducing the incidence of hookworm disease. Until such permanent improvements can be effected, much can be done by making treatment more freely available through extension of the village dispensary system and special treatment teams in mobile or movable dispensaries. These treatment teams should also undertake simple treatment for other conditions, especially schistosomiasis.

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V. Organization of Health Services

744 647 It is most important that a properly organized program should be established to carry out the suggested medical services and preventive health measures.

The existing organization for the health services is highly centralized—first within the Ministry of Social Affairs in Baghdad, then in the hands of the Chief Medical Officers of each province. The whole system appears to be too rigid throughout, without sufficient delegation of responsibility and without enough consultation among departments of the Ministry or with those of other Ministries. Certain medical problems (e.g. health in irrigation schemes, nutrition, etc.) concern other ministries or departments (irrigation, agriculture, education, etc.). To be really effective, boards or committees should include representatives of all groups concerned.

There is no general board of public health but there are various committees with different functions. The Director General of Health is responsible for the licensing of private practitioners and pharmacists, and he has a committee to assist him. But it is the Minister who sets up a committee to consider disciplinary Cases brought against practitioners or pharmacists by the Director General of Health. There is also a committee consisting of three Directors General and two other members nominated by the Minister who act in an advisory capacity to the Minister. It would be reasonable to expect the Directors General to be given wide powers without need for frequent reference to the Minister.

744 647 732 747 The health services have been repeatedly reorganized. The latest reorganization still does not appear to have defined very clearly the principal lines of responsibility. The Director General of Health is to be largely responsible for the curative services; a Director General of Health Affairs, for the public health services of Baghdad, Basra, Mosul, and Kirkuk, for the mobile dispensaries, and for health projects in cities, villages, and the countryside; and a Director General of Social Services, for the supervision of the administration of the institutions for the disabled and the blind, supervision of reformatories and health conditions in prisons and

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for the promotion of 'social centers'. It is understood he will also "take an interest" in the numerous voluntary societies that undertake work of a social and medical nature. 744 647 732 747

While this organization does not seem satisfactory, no alternative can be suggested at the moment without further study. The Mission would recommend that a foreign public health administrator be appointed to advise the Minister of Social Affairs on the organization and further development of the health services. His appointment, incidentally, would enable the Professor of Preventive Medicine in the Royal Faculty of Medicine, who is at present also acting as adviser to the Ministry of Social Affairs, to devote his full time to teaching and research. 744 647

The public health administrator should have had wide experience in the Middle East or in a tropical or sub-tropical country. He should have a good knowledge of the English language. To assist him he will require the services on temporary appointment of a foreign epidemiologist and a public health or sanitary engineer. The epidemiologist would undertake a study of the most prevalent diseases and recommend the best methods of attacking them. The public health engineer should have had considerable experience, preferably in a state medical service in a tropical or sub-tropical country, and be able to speak English. He would advise on measures to be taken to improve sanitation and environmental hygiene throughout Iraq and assist, if necessary, in teaching at the Royal Faculty of Medicine.

The public health administrator would require sufficient and suitable transport for himself and his staff; he would also need adequate office accommodation and office staff for himself and his own expert staff (epidemiologist and public health engineer). He should have at all times direct access to the Minister of Social Affairs.

As a result of the studies made by this team of advisers, it may be possible to give the organization of the health services a clearer focus. In any such scheme the preventive aspects of public health will need to be featured much more prominently. Although the borderline between curative and prophylactic measures may not always be clear, it may prove feasible to have one division responsible for all the services primarily curative

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and another division responsible for those characterized as principally preventive.

Meanwhile one important improvement could be effected by delegating more responsibility to the chief medical officer in each province and enabling him to devote his entire time to his public duties. The chief medical officer is responsible for all medical work, both preventive and curative, within the boundaries of the province. As such, his main duties should be to inspect the health institutions, to appraise the state of public health and to guide, advise and encourage his subordinate staff. To carry out this task effectively he needs to devote his full time to the job and should be free to travel freely about the province. At present, however, the chief medical officer usually has a private practice on the side. Without means of transportation at his disposal and, in fact, unable to travel without express permission from the Director General, he seldom leaves his headquarters. It is strongly recommended that these officers be paid salaries commensurate with their responsibilities and the importance of their post. Further, they should be provided with suitable transport and be required to submit a monthly report on the inspection work undertaken throughout the province. When necessary, a director (or medical superintendent) should be appointed to the hospital of the chief town of the province to free the chief medical officer for general inspection of all medical facilities under his direction. Similarly, doctors in charge of districts or *qadhas* should be provided with suitable transport to enable them to visit the dispensaries in their area. In certain districts they should also be provided with suitable housing.

It should be remembered, however, that without qualified personnel no reorganization, no matter how effective on paper, will succeed. In the health service, as in many other branches of the administration, conditions of employment must be considerably improved, particularly outside of Baghdad. Unless adequate salaries and accommodations are provided for the health services staff, doctors and trained personnel will continue to prefer private practice and specialized work in Baghdad and other cities.

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APPENDIX

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TABLE 1

HOSPITALS, HOSPITAL BEDS, DISPENSARIES AND DOCTORS
(by provinces, with populations)

Provinces	Hospitals	Beds	Dispensaries	Doctors	Population
Baghdad	30	1,988	56	419	805,293
Mosul	8	303	47	67	601,589
Basra	7	539	21	65	352,039
Hilla	5	264	21	25	261,903
Diyala	3	87	29	24	273,336
Diwaniya	3	117	25	22	333,787
Dulaim	4	181	18	12	193,294
Erbil	4	100	23	17	240,273
Kirkuk	5	207	28	58	285,878
Suleimaniya	3	103	15	14	222,732
Kerbela	3	228	14	22	276,670
Muntafiq	5	205	17	18	369,806
Kut	4	127	22	14	224,792
Amara	5	353	12	20	308,108
Totals	89	4,802	348	797	4,749,500

TABLE 2

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NUMBER OF VISITS TO HEALTH INSTITUTIONS FOR TREATMENT
(by provinces)

Provinces	1944	1945	1946	1947	1948	1949
Baghdad	1,004,856	1,255,348	1,523,935	1,471,621	1,553,020	1,664,023
Basra	306,612	312,842	378,903	373,735	381,907	382,241
Mosul	423,819	455,584	509,410	541,881	576,291	644,647
Amara	269,536	291,722	336,025	345,873	297,987	279,273
Erbil	144,453	155,649	147,164	165,704	150,572	168,980
Diwaniya	324,148	351,092	319,131	361,368	364,949	380,720
Diyala	288,912	284,181	319,518	343,626	322,715	357,198
Dulaim	199,063	199,996	239,952	248,285	227,797	222,030
Hilla	320,087	364,942	306,319	436,523	434,789	408,278
Kerbela	375,591	308,693	397,757	356,427	428,911	431,666
Kirkuk	133,571	168,809	229,044	209,588	202,219	206,556
Kut	188,978	230,255	202,970	211,061	234,522	257,991
Muntafiq	247,293	255,185	297,433	327,114	277,494	285,306
Suleimaniya	141,406	146,185	194,126	193,919	203,251	187,427
Totals	4,368,325	4,780,483	5,401,687	5,586,725	5,656,424	5,876,336

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TABLE 3

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Classification of Hospitals in 1949

Kind	Number	Beds		
		1st Class	2nd Class	3rd Class
I. Hospitals of the Ministry of Social Affairs				
General	39	53	185	2,720
For Eye Diseases	2			61
For Venereal Diseases	2			37
For Infectious Diseases	6	13	9	563
For Leprosy	1			240
For Children	1			89
For Children (Welfare Hospital)	1			35
For Women & Children	1			25
For Mental Diseases	1			85
Prison	6	4	2	105
	60	70	196	3,960
II. Other Government Hospitals				
Railways	1	3	14	40
Ministry of Education	1		26	
Police	1		5	25
Port	1	5	6	14
	4	8	51	79
III. Non-Government Hospitals				
General	4	57	26	147
For Eye Diseases	1	2	2	8
Oil Companies	4	18	16	109
American Mission	1			38
	10	77	44	302

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TABLE 4

The Chief Infectious Diseases Treated at All Health Institutions

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Diseases	1944	1945	1946	1947	1948	1949
Malaria	540,333	556,613	742,921	717,831	603,698	492,602
Trachoma	533,089	501,280	558,323	532,310	524,940	510,668
Venereal Diseases:						
Syphilis	19,372	27,550	33,104	25,625	23,168	25,255
Soft Chancre	3,802	3,510	3,025	3,753	1,428	3,283
Gonorrhoea	7,690	9,492	11,415	9,859	11,090	11,310
Dysentery	19,360	24,456	34,046	33,384	27,394	28,570
Schistosomiasis	15,852	18,744	21,029	24,923	24,272	27,388
Tuberculosis:						
Pulmonary	3,804	3,436	6,521	4,183	6,752	6,807
Other Forms	1,386	2,622	2,139	1,837	1,719	3,127
Influenza	13,906	18,070	26,291	24,882	29,572	29,993
Small Pox	178	59	1,468	62	2,025	736
Whooping Cough	1,957	2,329	2,968	5,344	4,452	4,175
Ankylostomiasis	6,332	7,319	13,992	12,041	8,927	10,754
Mumps	6,110	5,030	6,360	8,621	10,041	11,570
Sandfly Fever	2,070	842	4,688	3,711	1,248	1,521
Measles	809	657	1,468	2,147	1,812	1,936
Cancer	658	483	611	783	649	913
Typhoid Fever (group)	1,257	1,245	1,347	1,712	987	1,288
Erysipelas	314	284	288	304	337	306
Leprosy	217	279	240	223	270	179
Puerperal Fever	169	41	50	34	169	453
Plague	—	16	—	—	—	—
Diphtheria	210	237	283	406	903	612
Tetanus	160	171	136	141	239	236
Anthrax	133	178	170	213	206	186
Typhus Fever	791	491	170	379	154	72
Cerebro Spinal Fever	396	325	196	151	135	191
Scarlet Fever	1	11	31	6	185	6
Cholera	—	—	—	—	—	—
All Other Infectious Diseases	707	4,031	7,682	5,631	4,352	4,533
Total	1,181,053	1,189,801	1,480,962	1,420,496	1,291,225	1,178,670

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TABLE 5

CASES OF EYE DISEASES

Diseases	1944	1945	1946	1947	1948	1949
Trachoma	533,089	501,280	558,323	532,310	524,940	452,084
Conjunctivitis	410,522	422,572	481,877	447,425	445,376	510,668
Tumors of the Eye	5,806	7,699	7,371	9,460	10,258	6,575
Other Eye Diseases	65,615	71,626	60,428	58,256	51,985	70,392
Total	1,015,032	1,003,177	1,107,999	1,047,451	1,032,559	1,039,719

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TABLE 6

TREATMENTS FOR MALARIA AS PERCENTAGE OF TOTAL TREATMENTS AT HEALTH INSTITUTIONS

(By provinces: 1943-48)

Province	Total Treatments	Treatments for Malaria	Percentage
Baghdad	7,751,167	306,139	4
Basra	2,041,579	394,039	19
Mosul	2,909,256	475,065	16
Amara	1,769,157	102,172	6
Erbil	903,520	140,748	16
Diwaniya	2,000,261	300,043	15
Diyala	1,850,371	301,318	16
Dulaim	1,283,546	124,965	10
Hilla	2,131,928	487,170	23
Kerbela	2,180,664	487,886	22
Kirkuk	1,032,349	123,341	12
Kut	1,254,617	89,506	7
Muntafiq	1,624,345	240,525	15
Suleimaniya	1,005,355	97,714	10

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TABLE 7

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TREATMENTS FOR MALARIA AS PERCENTAGE OF TOTAL TREATMENTS AT HEALTH INSTITUTIONS

(By years)

Year	Total Treatments	Treatments for Malaria	Percentage
1923	317,615	57,552	18.1
1924	396,466	63,939	16.1
1925	501,925	86,688	17.3
*1926	645,392	175,923	27.3
1927	597,367	103,477	17.3
1928	636,861	87,467	13.7
*1929	1,035,524	158,902	15.3
1930	1,232,020	151,063	12.3
*1931	1,461,627	189,218	13.0
1932	1,600,933	178,871	11.2
*1933	2,113,273	239,629	11.3
1934	2,462,181	272,770	11.1
1935	3,882,079	338,804	8.7
*1936	3,780,982	640,967	17.0
1937	3,986,437	582,973	14.6
1938	4,093,753	524,292	12.8
1939	3,496,946	490,310	14.0
*1940	3,292,618	663,432	20.1
*1941	3,733,303	726,339	19.5
1942	3,875,657	575,780	14.9
1943	4,024,421	509,545	12.7
1944	4,368,327	540,333	12.4
1945	4,780,483	556,613	11.6
*1946	5,401,687	742,921	13.8
1947	5,586,725	717,831	12.8
1948	5,656,424	603,698	10.7
1949	5,876,336	492,602	8.4

* Flood year

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TABLE 8

Incidence of Schistosomiasis
(By provinces)

Province	Percentage of Incidence of Schistosomiasis
Baghdad	35
Basra	23
Mosul	0
Amara	67
Erbil	0
Diwaniya	26
Diyala	28
*Dulaim	36
Hilla	15
Kerbèla	28
Kirkuk	0
Kut	48
Muntafiq	47
Suleimaniya	0

* Survey for all the districts of the province not yet completed.

TABLE 9

Cases of Schistosomiasis Treated
(By provinces)

Province	1944	1945	1946	1947	1948	1949
Baghdad	4,544	4,920	6,986	6,175	5,358	6,733
Basra	1,527	1,922	1,836	1,934	2,384	4,508
Mosul	83	92	110	85	90	59
Amara	865	973	1,300	1,518	1,680	843
Erbil	15	27	10	45	16	25
Diwaniya	1,546	2,142	2,035	2,024	2,756	3,166
Diyala	611	288	259	243	238	357
Dulaim	74	375	283	704	622	838
Hilla	594	2,158	802	2,381	1,514	1,113
Kerbela	1,077	930	1,471	1,567	1,544	1,458
Kirkuk	14	26	5	12	27	5
Kut	1,868	1,976	1,616	2,346	3,099	2,482
Muntafiq	2,969	2,909	4,310	5,890	4,942	5,801
Suleimaniya	5	6	6	2	2	—
Total	15,792	18,744	21,029	24,926	24,272	27,388

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TABLE 10

Forms of Tuberculosis Treated at All Institutions

Form	1944	1945	1946	1947	1948	1949
1. Respiratory (Lungs & Larynx)	3,844	3,438	6,521	4,183	6,752	6,807
2. Meninges	2	922	44	52	19	56
3. Intestine, etc.	83	101	148	79	92	141
4. Spinal Cord	83	71	189	133	158	184
5. Bones and Joints	396	324	331	304	353	592
6. Skin	317	187	1,005	887	639	911
7. Glands	303	318	302	294	324	923
8. Genito-urinary System	7	19	21	10	15	12
9. Other Organs	138	659	61	71	107	212
10. Disseminated	17	21	38	7	12	96
Total	5,190	6,060	8,660	6,020	8,471	9,934

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ANNEX G

EDUCATION

I. Introduction

100 Educational reform and reconstruction is a basic condition for the physical, mental and social health of the people and for the agricultural, industrial and technological progress of the country. Even from the limited point of view of improving material standards, it is necessary not only to expand the educational facilities but also to evolve a better and more suitable type of education which will help to provide trained and efficient personnel for carrying out the various development projects that may be undertaken by the government. Without the availability of such personnel in adequate numbers, the projects, however perfect on paper, are likely to come to grief.

This, however, is not the only justification for launching a program of radical educational reconstruction. As long as almost 90 percent of the population remains illiterate and deprived of the barest elements of what is aptly known as Fundamental Education, the benefits of national economic development are unlikely to be diffused widely enough to make a real contribution to stable social and political conditions. Nor can democratic institutions be expected to thrive unless people are educated, not in the limited and unsatisfactory sense of merely being able to read and write, but in a proper understanding of their civic rights and obligations and the implications of community life in the modern world.

Above all, the supreme object of all increase in national wealth which may be brought about through wise investment in productive enterprises is to increase social well-being and happiness and to enrich and improve the life of the common man, relieving him from the bondage of poverty, ill-health, ignorance and cramping superstition. In the attainment of this objective, education—of both children and adults—obviously has to play a dynamic and decisive role. Development cannot simply be imposed from the top upon a passive population. It requires a thorough-going

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mobilization of the energies of the entire population. People must be awakened to a full appreciation and understanding of their problems. Only in this way can they be brought to a realization that without well-directed cooperative self-help on their part the government's development program cannot succeed.

Since the whole process and system of education—from the primary school to the university—must be visualized as an integral whole and its different stages intelligently dovetailed into one another, it is to be hoped that the government will give due attention to educational needs at all stages. During the last two decades, these problems of education have been studied and reported upon by several committees and educational experts; e.g., in the Report of the Monroe Commission, Allen's Report on Rural Education and Welfare in the Middle East, the Report of the Higher Committee of the Ministry on the Revision of Courses, the Report of the Departmental Committee on the Ten Year Plan, Morgan's Report on the University of Iraq, and Clark's Report on the Introduction of Compulsory Education in Iraq. These reports contain a number of excellent suggestions and proposals which are almost as pertinent today as they were when they were originally made. It is a matter of regret that circumstances should have stood in the way of their implementation. The Ministry of Education should make a careful study of these documents and take their recommendations into account in formulating an over-all policy of educational development.

The present Mission, however, is primarily interested in the part which education can play to facilitate and support the development program as a whole. Its studies have been directed therefore to the establishment of "priorities" with a view to concentrating on those aspects of education which are most directly and immediately connected with the economic development of the country. It has thus come to the conclusion that the following three aspects of education impinge directly on the improvement of productive capacity:

1. Compulsory, universal, primary education for children;
2. Fundamental education for adults; and
3. Vocational and technical education related to development needs.

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Compulsory primary education is the only way to broaden the educational base. Without it illiteracy can never really be stamped out and the people given the means of acquiring the practical knowledge which will enable them to raise their standard of living through their own efforts. Similarly, adult education is necessary if nearly the whole of the present generation beyond primary school age is not to remain illiterate and be denied the opportunity to learn ways and means of improving their living conditions. The need for vocational and technical education should require no detailed justification in a country where the lack of technical skills seems to be one of the most serious obstacles to rapid development.

II. Introduction of Compulsory Primary Education

It is sometimes argued that the country is not yet ripe for the introduction of compulsory primary education and also that, if the government provides the educational facilities, it will be sufficient to rely on voluntary school attendance. Judging from the testimony not only of educational officers, but of many men in public and private life, the Mission believes that there is a widespread conviction that the time is ripe for a big advance in the direction of compulsory education. This opinion is also reflected in a number of recent reports and educational publications, including the Report of the Committee appointed by the Ministry of Education in 1946 to draw up a Ten Year Plan for Education, and Clark's Report prepared in 1950. A striking testimony to this awakened public consciousness is provided by the fact, revealed by Directors of Education in several provinces, that in many villages without schools, local people (and the local landholders in some cases) were prepared to construct school buildings provided the Ministry of Education was willing to find the teachers.

Compulsory vs. Voluntary Attendance

This does not mean, however, that the problem of universal education will be solved simply by creating adequate educational facilities. First of all, the government must plan a school-building and teacher-training program in advance, and this can take place

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871 only in relation to some predetermined goal. The Mission considers that this goal should be to bring primary education to all children of school age; currently they number about 750,000 but only 175,000 are actually in school. Despite the growing recognition of the value of education, it would be unrealistic to suppose that this goal could be achieved without compulsory attendance. In many cases the value of education will be appreciated only after children are brought into contact with it through some measure of compulsion. This will be true particularly of education in rural [562] areas and of education of girls. In 1948-49, for instance, there were only 43,000 girls in primary schools as compared with about 132,000 boys. Moreover, compulsory attendance is necessary not merely to get children into school initially but also to make sure they will stay there long enough to acquire permanent literacy and the modicum of basic education necessary to improve and enrich their lives. In the cities educational facilities have been much more easily available than in the country, but without compulsion there has been a sharp drop in attendance with each successive school grade. Dr. Akrawi in his work, *Education in the Arab Countries*, presents figures showing the following distribution of enrollment in primary schools in 1944-45:

Grade I	Grade II	Grade III	Grade IV	Grade V	Grade VI
32%	18.3%	14.9%	12.8%	11.7%	10.1%

This suggests that there is a high percentage of wastage in the first year and that the roll in Grade VI is less than one third of that in Grade I. In fact, there were only 9,500 children in Grade VI as compared with 22,000 in Grade I six years before. More recent figures for certain specific areas show some improvement but it is not so marked as to alter the general situation. Thus, in the city of Baghdad where educational awakening is greatest and educational facilities most generous, out of 6,970 children in Grade I in 1945-46, only 5,315 passed on to Grade II in 1947-48 and 3,587 to Grade VI in 1950-51; i.e., about 50 percent dropped out before completing the primary stage. In the city of Kerbela only 209 out of 645 children in Grade I reached Grade VI, a wastage of about 66 percent.

The investment in the education of children who remain in school no more than three years represents a dead loss. Even that

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devoted to children who drop out in the last three years must be regarded as at least a partial loss. Enlightened educational opinion all over the world is agreed that six to seven years is the minimum period in which a child can acquire the basic modicum of knowledge, skills, habits, interests and social attitudes necessary for civilized living in a modern community. The Iraq Government has prescribed six years as the period of primary schooling, but the objective is obviously not being achieved if more than half the children are eliminated, for one reason or another, before completing this period. 871

The Quality and Orientation of Education

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It is sometimes contended that a program of nation-wide education should be postponed until the quality of education is considerably improved. While the Mission does not support this contention, it is firmly convinced that education will not win the support of the people or have any perceptible impact on their lives unless it is given a new orientation. It is, therefore, necessary to take simultaneous measures for the improvement of education—its methods and techniques, its curricula, its organization and administration and, above all, its personnel and their ideology and outlook. Education, as it is provided at present, is concerned with only a part of the child's development. It leaves a large area of his aptitudes and his mental and emotional make-up untouched.

In the proposed reconstruction of education, it will be most important to give it a more practical, realistic and rural bias in order to relate it intelligently to the psychological and social needs of the individual child and the adult society. It is a well-known fact of child psychology that the child is by nature an active, pragmatic person who delights in doing, creating, playing and generally expressing himself in various practical ways which grow increasingly purposeful with age. Unfortunately, the primary and secondary schools as well as training colleges at present seem to be hardly aware of the basic importance of bringing education into harmony with this crucial fact of child psychology. In fact, with the exception of a school handwork exhibition at Baquba, a promising display of handwork specimens in the Primary Teachers' Training College in Baghdad and some quite good examples of stitching and embroidery and the like in a few girls' schools, the schools were

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found to be entirely preoccupied with the classical and literary tradition. It is true that the Arab mind has a flair for language and literature and delights in oral self-expression, and young children learn to read and write quickly and speak with a fluency and feeling for words which children of other lands would find difficult to emulate. But with the increased importance of science and technology and the need of improving productive efficiency in industry, agriculture and other occupations, the people of Iraq cannot afford to remain content with a system of education which does not equip the younger generation to play its part in the projected plans of development.

Once educational authorities clearly recognize that the introduction of activity-centered methods and curricula and of craft work is basic to the whole idea of educational reconstruction, it should not be difficult to work out the necessary measures. In many other countries, such a reorientation of education has been actually achieved, and not only detailed theoretical discussion but records of concrete, practically worked-out schemes are available for consultation and guidance. It will, of course, not be possible—and even if it were possible, it would not be desirable—to copy these methods and schemes mechanically, because education is a creative field in which ideas have to be applied to the particular situation in which one is working. It will be necessary for Iraqi educators to work out their own pattern of "activity schools" and their appropriate forms of craft work. In fact, some gifted educators have already envisaged this problem in its true perspective. Dr. Matta Akrawi's thesis on *Curriculum Construction in the Public Primary Schools of Iraq* (published in 1942) is an effective presentation of the case for reorganized methods and curricula breaking with the narrow academic tradition. What is more, it gives concrete instances of how units in social studies and health education can be worked out in such a way as to break down the barriers between schooling and life.

What kind of crafts can be introduced in the village and city schools which will appeal to the children and will also be related to their environment so that they can leave school with trained skill and aptitudes and participate effectively in the work of their communities? The answer to this question can be given only after

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study, but two important considerations should be kept in mind. The crafts should be as varied as possible and linked to local occupations, and they should make maximum use of cheap local materials so that the cost of their introduction will not be too high. The object would not be to produce trained craftsmen, but to make children adept at working with their hands, to give them an opportunity for creative expression and to inculcate an appreciation of the value of manual labor. For the same reason the teachers need not be specialists in individual crafts, but people who are handy with tools, can work with different materials and in different media, and have a general understanding of the principles, objectives and methods of craft work by children.

In rural schools in particular, it is important to have small plots of land for gardening and agriculture where children can learn simple agricultural processes and the care of livestock as well as the use of tools. They should also have the opportunity to visit any government demonstration farms in the neighborhood. In order to insure that rural schools really cater to rural needs it will be necessary to draw more teachers from rural areas and to establish more rural training colleges where effective practical as well as theoretical training is given in agricultural subjects. More rural secondary schools with a dominantly agricultural bias in their curricula are also needed. They can serve the dual function of providing teacher candidates with suitable education and background and also of providing centers for agricultural extension work in the neighborhood.

One of the primary objectives of the reorientation of education should be to challenge children to meet the problems of their environment squarely instead of running away from them. A school is not just a place for academic learning or even a combination of academic and practical work. It is essentially a community where young people should learn the basic art of living through actual experience. It should afford opportunities for cooperative and group work, for leadership and discipline, and at the same time place before the children projects and activities which will enable them to understand the problems which dominate the life of their local, and later national, community. The school should inculcate an appreciation of the value and dignity of hard, manual work. Th

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this way the school can contribute to a much needed spirit of social service among children and youth at various stages of education. Thus a school lesson will become a living experience and bridges will be thrown across the gulf that exists between education and life to their mutual advantage and enrichment. These may appear, to the layman or the traditionally minded teacher, to be rather theoretical and remote considerations. But unless school problems are envisaged in these broad terms, the school will never become a dynamic and life-giving agency for the nation. And in fact, these considerations have been incorporated to varying degrees in the educational systems of many advanced countries and in many progressive schools.

In any reorientation of educational methods there must also be a simplification of the syllabus. The tendency has been to overload the syllabus with many subjects, all of which the child is expected to memorize primarily for the purpose of passing examinations. In the primary schools there are nine or ten subjects; in the secondary schools the total goes to 10-12; and in the training colleges as many as 15 different subjects are taught in one year. The contents of the existing syllabus in each subject and at each stage of education must be critically re-examined in the light of individual and social needs, and curricular cargo which is merely traditional and outdated must be thrown overboard. The Ministry is itself aware of this situation, and well-informed educators and some committees appointed in recent years to examine primary and secondary school curricula have drawn attention to this urgent problem. Dr. Matta Akrawi's thesis, to which reference has already been made, formulates comprehensively and soundly the principles which should guide workers in this field and provides practical illustration of what can be done. Care must be taken to vary the syllabus in accordance with local needs and to leave the teachers some opportunity for experimentation. For example, in bringing educational facilities to the nomads and the remote villagers, it must be remembered that the needs of the children and the adults living in these more primitive communities are different and in many ways more limited than those of the more sophisticated urban residents on whom the impact of modern civilization has been more direct and greater. It is, therefore, essential that the

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Ministry prepare a simplified syllabus and curriculum for such rural areas. It should concentrate on the basic essentials of knowledge and skills related to everyday living that can be easily grasped. This applies both to the school program for children in schools and to the program of fundamental education for adults.

Steps Toward Compulsory Primary Education

Many problems and difficulties will undoubtedly arise in enforcing compulsory education, but once the need is recognized and the policy agreed upon, attention can be concentrated on solving them. Public opinion in certain regions and groups will have to be educated; a careful survey of each locality will be needed to assess the existing educational provision as well as future needs; an effective administrative and supervisory organization will have to be established; some special provision will have to be made for children who cannot afford books or midday meals or whose parents want their help in work on their farms; and, most of all, the type of education to be provided will have to be related intelligently to the real needs of rural or urban life so that the children, as well as their parents, may feel that it is really worth their while and perceptibly useful. The special problems and difficulties of Bedouin education will have to be carefully examined.

Fortunately, a good deal of exploratory work of a theoretical nature has been done and, as already pointed out, a number of valuable studies are available which offer useful suggestions in all these fields. The Report of the Monroe Commission lays down general principles of educational reorganization, some of which have special relevance for primary education; Clark's Report is a good and careful, if rather unduly cautious, study of the issues involved in the introduction of compulsion; Dr. Jamali's book, *The Education of the Bedouins,* is a sympathetic and penetrating study of the whole sociological and psychological background of this problem; Dr. Akrawi's thesis on curriculum construction tackles competently the question of how the curriculum can be related dynamically to "the political, economic, social, hygienic and educational conditions and problems of the country;" and the Departmental Ten Year Plan and certain reports of other government committees endorse to some extent the various suggestions made in these studies. Theory has yet to be translated into practice,

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872 however, and there is little evidence to show that a majority of educational officers and administrators have even successfully assimilated the ideas in theory. In fact, the Ten Year Plan Committee complains that even the officials of the Ministry have not had access to many of these documents and, therefore, are obviously not conversant with the suggestions for reorganization made from time to time. It would be advisable to give due publicity to them among teachers and educational officials.

The Mission makes the following proposals in connection with the initiation of a program for the expansion of primary education and the introduction of compulsion:

1. A careful survey should be made of each locality in order to determine the requirements which must be met in carrying out the program. If possible, senior students should assist in making the survey. This will have the incidental advantage of giving them a close and useful contact with the life and educational needs of the local community.
2. The Ministry of Education should organize an effective campaign in favor of compulsory education through the traditional as well as the modern media of mass communication, e.g., religious leaders and organizations, tribal chiefs, public platform, drama, press, film, radio, publicity vans, and the like.
3. As the program is carried out through the construction and opening of new schools, a continuing and imaginative effort must be made to enlist the support of the local community and give it a definite sense of participation. Thus the opening of a new school might well be made an important community event in a manner which will make the local people realize that something of real value is being added to their life, something which does not "belong to the government" but really belongs to them and which can succeed only with their cooperation.
4. Arrangements should be made for the proper administration and supervision of the program both through departmental and local agencies, with an intelligent demarcation of the functions of each. The general organization and control of this and other large schemes of educational expansion should, at this stage, remain in the hands of the Ministry which will, however, need to be strengthened to handle them properly. The role of the local authorities, while undoubtedly important, should be advisory in the early stages.

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5. It would be well to introduce the scheme gradually in different areas according to a carefully considered order of priority, preference being given to places where there is a strong demand or where other factors are favorable.

6. Pending the introduction of full-fledged compulsion it might be advisable to experiment in some localities with a legal requirement that parents who have once enrolled their children in school keep them there until they complete the primary school course or, in the event of failure in any grade, complete the six years' period of schooling. This would mean that, while admission would be voluntary initially, continued attendance for six years would be compulsory for every child admitted. This suggestion can be more profitably enforced in the larger towns and cities, where there is greater realization of the need for education; it might also be tried out in localities where wastage is most marked.

7. In order to minimize as much as possible the difficulties of the rural parents in sending their children to school, it will be desirable to adjust the school schedule and the school holidays to the requirements of agricultural seasons as far as possible. The time of harvesting, for instance, varies in different parts of the country and there is no reason why the school vacations should not take that important factor into account. Again, even when the school has to remain open in the busy agricultural season, the hours can be shortened during that period to enable children to help their parents in their work.

8. Steps should be taken for an immediate expansion of training facilities for teachers as discussed later. At the same time there should be an improvement in the quality of training imparted.

9. The school construction program must be geared to the requirements implicit in the introduction of compulsory primary education; and, simultaneously, efforts ought to be made to improve the equipment of the schools.

It is not necessary to discuss at length the administrative questions involved in the introduction of compulsion since they are known to the Ministry and have also been elucidated in Clark's Report. It is desirable, however, to treat in somewhat greater detail the problems of the training and conditions of employment of teachers and the construction and equipment of the necessary schools.

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Requirements for Teachers

875 The Mission has estimated, as will be indicated in detail later, that about 18,750 additional teachers will be required for the introduction of compulsory primary education. If it is proposed to bring all children of school age into school within 10 years, an average annual output of approximately 1,800 additional teachers would be necessary. In view of the many administrative, social and economic difficulties which are to be expected, it may be necessary to accept an annual target of about 1,500 new teachers. In any event, prompt measures must be taken to establish new teachers' training colleges. The following tentative time schedule is suggested in this connection on the assumption that the average period of training for primary school teachers—with perhaps somewhat higher academic qualifications for admission than those prescribed at present—will be about three years.

1952 —Preparation of plans for the opening of new training colleges so as to insure the requisite number of teachers.

1953-1954—Opening of additional training colleges which may take two years. (In view of the fact that most of the existing institutions are overcrowded, it would be inadvisable to increase admissions in them.)

1956 —The first group of trainees will complete its training.

1957 —The full annual quota of additional teachers will become available for the opening of new schools.

During these five years, 1953-57, compulsory attendance should be introduced in some suitable localities with the help of the teachers being trained in the existing colleges and the first group of new trainees under this scheme. This period should also be utilized, as suggested in the preceding paragraphs, for survey work and for preparation of public opinion, as well as for getting underway a systematic program of school construction. The bulk of the plan can then be put into effect during the next 10 years, i.e., 1958-67, with the determined object of bringing almost all children of school age into school. Even then it is likely that there will be many children in remote and comparatively inaccessible areas and scattered nomadic groups for whom schooling may not have been arranged by that time. The next five years, 1968-72, should therefore be utilized for taking education to such children, for tying up loose ends, for checking and assessing results

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and generally making sure that educational provision of a reasonably good quality is available to every child in the country. By 1970 the program should thus be fully and adequately implemented.

Quality of Teacher Training

As more teachers are trained, the quality of their professional education also needs to be raised. In many respects their training is now deficient:

> The present size of most of the training colleges appears to be too big to allow for adequate personal contact between the teachers and students or to make satisfactory arrangements for teaching practice possible. The proper concept of a training college is that of a small, well-knit social community, living, learning and working together. This is difficult to achieve when several hundred teachers are being trained in a single, overcrowded institution. A reduction of numbers is, therefore, desirable in the case of the bigger colleges and should be gradually brought about.
>
> The members of the staff of the training colleges have often lacked not only the requisite technical skill but the personal qualities necessary to inspire young teachers. Unless each teacher goes out of the college with a real sense of mission, he will not be able to play his part in the proposed educational transformation.
>
> At present the colleges have to give too much attention to general education at the expense of professional education. As soon as the Iraq University begins to function and its Arts and Science Colleges are properly organized, institutions like the Higher Teachers' Training College and the Queen Alia College should become centers of professional education for teachers. The possibility of a similar change should be explored in the case of primary training colleges which are also at present providing partly secondary and partly professional education.
>
> The courses prescribed in these colleges are too crowded and miscellaneous. They are not related closely enough to the real teaching problems and situations in rural and urban areas, nor are the methods and techniques of teaching irradiated by modern and progressive educational ideas. The whole problem of making the courses and methods more dynamic and realistic should be examined by a competent committee.
>
> Except in one or two institutions, practical work and crafts are conspicuous by their absence. Even the members of the staff do not recognize clearly enough that no far-reaching

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change can be brought about in the schools unless a place of honor is given to hand work and crafts in the education of teachers. The committee suggested in the preceding paragraph should examine this problem also.

No training college has a "Demonstration School," in the real sense of the word, attached to it. The practicing schools of the colleges are dull and uninspiring and do not generally differ from the routine of ordinary primary or secondary schools. They enjoy no special freedom and apparently have no special facilities to work out new techniques or to pioneer in curriculum or organization. This is a very serious defect which should be remedied as early as possible.

There are only a few rural training colleges, established with the laudable idea of educating teachers in a rural milieu and with special reference to rural needs and problems. But they do not appear so far to have been given a real opportunity to prove themselves, and the conditions necessary for their success—material as well as those relating to personnel—have not been satisfied. Given a fair chance, these institutions can play an important role in the reorientation of teachers' education.

A determined effort to overcome these defects of the training colleges should be made. It is necessary to recast their curricula radically, to reduce the overcrowding of subjects, to simplify the syllabus, to find proper place in it for practical and productive work and to bring the whole training nearer to the realistic conditions of the rural or urban areas for which teachers are being trained. All the rural training colleges—whether existing or to be established—should, in the first instance, be located in rural areas, should work under rural conditions and should study rural problems. They should develop as leadership centers for the reconstruction of the neighboring community life. Their extension work should spread into the neighboring villages and they should take the lead in working out methods and contents of education suited to village schools. Such things have been done, with varying degrees of success, in other countries and there is no reason why they should not be attempted in Iraq.

It is also important to develop a spirit of self-help and resourcefulness in the teachers under training. At present they rely for almost everything on government help and finances. A community of several hundred teachers, all resident in hostels, should have enough talent and productive capacity to work out practical

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projects in agriculture, craft work, social service and methods of self-help in meeting many needs for which the government may not provide. In one training college there was evidence of such an approach; teachers had constructed temporary shelters for their needs and were actually using them for residence, for doing practical work and as dining rooms. There is need to make this kind of work a normal feature of training colleges, for it is only teachers who are resourceful and handy with tools and willing to face problems as they arise who will be able to build up the kind of schools envisaged and provide educational leadership in villages.

Attractiveness of the Teaching Profession

The government will have to consider seriously whether an adequate number of properly qualified people will be attracted to the teaching profession on the basis of the present salaries and prospects. This question is, undoubtedly, linked up with the grades and salaries offered in other government departments and services but there are some special factors which must be taken into account. Education is, in a very real sense, an essential social service. If the state is anxious to secure a large and contented personnel for its schemes of expansion, it must offer salaries and other conditions of service which will attract promising and suitable young men and women to the teaching profession and not the "left-overs" of other departments or those who have no other recourse open to them. Moreover, teachers do not have the same opportunity as many other civil servants of obtaining special privileges or income in addition to their salaries. In the coming years—with schemes of compulsion and adult education, teaching of crafts and the like in the offing—they will have to bear additional and exacting responsibilities. Teachers must have enough not only to meet their material needs—food, clothing, medical care and tolerable housing accommodations—but also to educate their children and leave some margin to lead a cultured life in which books and magazines play an important part. There is, apparently, considerable discontent among teachers of all grades with their present financial position. However, teachers' salaries and grades were recently revised, and it has been stated that they now compare somewhat favorably with corresponding posts in other departments. The Mission is not, however, in a position to judge whethe

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875 this meets the needs of the situation fully and would strongly recommend a careful and sympathetic examination of the whole problem in the light of existing conditions. Such an examination should include also the question of providing housing accommodation for teachers, particularly women teachers, in villages.

The question is not, however, merely one of salaries but rather of raising the whole dignity and status of the profession. [554] In Iraq teachers do not, as a whole, apparently suffer from a sense of social inferiority as is the case in some other countries. This is good but not good enough. It is necessary to insure for them a position of honor and prestige and to accord conspicuous recognition to any meritorious work done by them. The government should endeavor to have the public realize the basic value of their work as nation builders.

School Construction and Equipment

346 872 Whether or not there is an immediate extension of primary education, school construction has to be tackled urgently. The number of schools is inadequate even for existing needs and they are ill-planned and overcrowded. About 40 percent of the schools are said to be housed in rented buildings, which are generally poorly constructed and lighted. Many of the government buildings and those built out of public subscriptions are only a little better. Almost all of the schools, whether government or rented, have now become too small for the number of students enrolled, and the introduction of the compulsory principle will bring a large further increase in enrollment. It will, therefore, be necessary to undertake without delay a carefully planned and large-scale program involving the construction of new school buildings and the improvement and extension of existing buildings.

Much of the new building will have to take place in rural areas. The Ministry should, therefore, arrange for a competent study of the problem of village school buildings—in which teachers, builders and the school architect will all be associated—in order to prepare two or three types of plans suited to different climatic regions. The buildings can be economical without being ugly or cramped or deprived of proper lighting and ventilation, and should reflect local traditions and utilize local materials. It would be a

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wise investment to spend some money on intelligent research and experimentation in this field. The program of buildings should also include, as suggested above, the construction of teachers' houses—particularly for women teachers—in places where they are not otherwise available.

More attention might well be paid to the equipment of new and existing schools. The libraries, for instance, are generally poor: the number of books is small; they are not chosen with reference to the needs of the children for whom they are meant; their arrangement and display leave much to be desired; and the service provided is very unsatisfactory. No proper individual records of students' reading are maintained and no imaginative steps are taken to stimulate the desire to read and to make the library a dynamic and integral part of the school and of the life of the students. The library often consists simply of a few crowded, dust-laden bookshelves in one of the classrooms to which students have access at odd times and for short periods for borrowing books. School libraries not only should be stocked with a large number of well-displayed and suitable books but should be made the most pleasant and attractive place in the school.

The laboratory and workshop facilities provided, even in full-fledged secondary schools, are also inadequate. There can be no proper teaching of science or crafts unless the equipment is greatly improved and practical work is given its due place. Apparently there is no examination in practical work at all at the end of the secondary school, and obviously there can be none so long as most schools have no laboratories or workshops, or very poor apologies for them. In fact, of the large number of secondary schools visited, only two, one government institution and one foreign school, had adequate laboratories. Under the circumstances, science is generally taught theoretically, as a lesson from the printed book or as a lecture by the teacher, with occasional demonstration of experiments by him in front of the class. This kind of vicarious experimentation, which never allows the students to handle any apparatus, does little to foster the scientific attitude. The provision of laboratory facilities will not by itself, however, make any great difference—what is needed is the introduction of activity methods in the teaching of science and the use of science as an instru-

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ment to develop the students' powers of inquiry and independent work. In the proposed transformation of "book schools" into "work schools" this change coupled with craft work may well form the starting point of the process.[1]

Financial Implications of the Introduction of Compulsion

It is difficult to work out the cost of the proposed scheme for primary education with any degree of accuracy because reliable figures and statistics are not easily available. However, on the basis of information supplied by the Ministry and obtained from other sources, it is possible to form an approximate idea of the order of expenditure that will have to be incurred. It should, however, be borne in mind that, generally speaking, the basis of calculation adopted is the per capita educational expenditure being incurred at present and, as the current provision for such items as books, furniture, apparatus and hostel accommodation is rather inadequate, the total cost worked out represents the minimum estimate of the requirements.

The three main items of expenditure in this program would be (1) the cost of operating primary schools for all children; (2) the cost of training additional teachers; and (3) the cost of constructing new buildings and improving or extending existing buildings.

Cost of Primary Schooling

According to available figures, the total number of additional children to be brought into school eventually, when compulsion has been introduced throughout the country, would be about 575,000. The present annual cost of primary education per child, according to the calculations of the Ministry of Education, works out at eight dinars. This estimate is also endorsed by Mr. Clark in his report. On this basis it can be assumed that the ultimate annual cost of schooling for all children of primary school age will be about ID 4,600,000. It should be remembered, however, that this estimate does not allow for higher salaries and prices which will

[1] In this connection, all science teachers might make a careful study of the fascinating pioneer work in the domain of science teaching done by the eminent British educator, Sanderson (Headmaster of the English Public School, Oundle). An account of his work will be found in two books—his biography by H. G. Wells entitled *The Story of a Great Schoolmaster* and a book written by his colleagues entitled *Sanderson of Oundle*.

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almost certainly increase costs. As the Plan goes into operation, the cost may also tend to rise for other reasons—because the number of children will increase with the growth in population during the next two decades, and because the provision of a better type of education, with a more practical orientation, and the strengthening of the inspection agency will mean a somewhat higher per capita cost. The organization of schools into community centers as recommended elsewhere will also affect the question of cost. On the other hand, it is likely that, during the stipulated period, perhaps 10 percent of all the children may escape schooling, which will lower its cost correspondingly. In this approximate estimate, it is not necessary to allow for these factors, because it is expected that the increase, if any, will be met by the normal expansion of the national budget. Table I in the appendix gives a breakdown, year by year, of the number of children to be admitted and the cost to be incurred on their schooling. This table envisages the extension of compulsory education to 562,500 children in 13 years, and the annual cost has been worked out on the assumption that 22,500 children, on the average, will be brought into school every year. If the scheme is put into operation in 1956, when the first group of trained teachers will become available, then during the one year that will fall within the next budget quinquennium, 1952-53 to 1956-57, the additional expenditure to be incurred will be ID 180,000. In the following 10 years, the total expenditure to be incurred for compulsory primary education will be about ID 21,600,000 or an average annual expenditure of ID 2,160,000.

Cost of Training Additional Teachers

The total number of additional teachers required for introducing universal, compulsory education has been estimated in Clark's Report at 15,000. The Ten Year Plan Committee, which aimed at bringing 50 percent of the children into school in 10 years, puts the figure at 8,000, allowing for the normal wastage due to superannuation, etc. Both these figures appear to be an underestimate. In calculating the cost of universal, compulsory education the Mission has aimed at putting 562,500 children in school in 1968. If the average number of children per teacher is put at 30, this means that 18,750 additional teachers will be required for the purpose, and provision will consequently have to

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875 be made for their training.[2] The annual cost of training per teacher is estimated by the Ministry of Education to be about ID 70. If the average period of training is taken to be three years, as is likely to be the case in the future pattern of teacher training, the cost of training per teacher would be a little over ID 200. Table II in the appendix shows the number of teachers under training each year from 1953 to 1967 and the expenditure to be incurred every year over the project. From these figures it will be seen that the cost of the scheme during the next five budget years (1952-53 to 1956-57) will be about ID 737,500. Total cost until 1967, spread over 13 years, will be a little below ID 4,000,000 which means an average annual expenditure of about ID 300,000. It may be pointed out that, after this period, when the full quota of trained teachers is available, the annual expenditure on this item will be considerably reduced as provision will have to be made only for training the number of teachers required for normal replacement.

Cost of School Buildings

346 872 The problem of the construction of school buildings was surveyed recently by the Special Committee on School Buildings appointed under Ministerial Order No. 36314 of December 7, 1950. After consulting experts, the Committee drew up a program for the construction and improvement of schools and other educational buildings at a total estimated cost of approximately ID 8,110,000. The Mission was not able to ascertain definitely the premises on which this estimate was based. The Development Board has made a provision of ID 3,800,000 for school construction in its program for 1951-52 to 1955-56. The Mission suggests that the adequacy of this allocation as well as the total amount which would need to be spent over the next 10 years be carefully reviewed. In this review the Committee's estimate should be carefully checked, particularly to determine whether it took fully into account the needs arising out of the introduction of compulsory education as well as requirements for replacing old or

[2] If the basis of calculation were 35 children per teacher, the total number of teachers required would be about 16,000. But as the Ministry of Education has itself wisely adopted the ratio of one teacher to 30 children, the Mission accepted that as the basis for calculations.

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rented school buildings. In any event it would seem desirable to raise the budgetary provision for new buildings to approximately ID 5,000,000 for the next five years. New needs may develop, lacunae may be discovered in the program and the cost of construction may rise. The total cost of the whole building program in the 10 year period may not be over ID 10,000,000, particularly if local help and cooperation is enlisted in the building.

The total financial implications of the whole scheme during the next five budget years (1952-53 to 1956-57) can be indicated in approximate figures as follows:

1. Operation of new primary schools	ID	180,000
2. Training of teachers		737,500
3. Buildings		5,000,000

Total expenditures for the program over the next five years will thus be about ID 5,900,000 which works out at less than three percent of the net revenues expected from oil during this period.

III. Provision of Fundamental Education for Adults

There is no phase of education in the country which has received less attention than the education of the adults. Not only are facilities for adult education almost wholly lacking, but there is a general misunderstanding of the purposes and methods of such education. A number of evening primary and secondary schools are run by the government or by private organizations, such as Teachers' Associations, for adults who work in the day and who want to complete the education they began as children. Their courses, however, are not designed to meet the special needs of such adults but are the same as those taught to children in the day schools. There are also a few "literacy centers" attended by illiterate adults and youths, but they are too few to make any appreciable impact and, as the name suggests, confine themselves to making adults literate.

The type of adult education which the Mission suggests should be widely extended in Iraq is not a matter of either the simple teaching of literacy or the instruction of adults in the same courses offered to children. To be sure, the initial objective would be the

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[173] eradication of illiteracy, but primarily as a means to an end—so that adults may benefit more fully from a continuous program of education which will show them what they can do individually and collectively to improve their own lot. As one authority has said, the task must be conceived "as a matter of going out into the field, of working in the communities, organizing their activities, improving their health and farming methods, establishing cooperatives and small cottage industries and tying all this up in the education and making the whole thing as closely knit an activity as possible."[3] The object must be to awaken in people an understanding of their problems and an urgent desire to solve them, not relying upon government to do everything but developing local initiative and resourcefulness to overcome some of the handicaps which they have suffered passively for centuries. Only this type of fundamental education, which, in recent years, has been advocated by UNESCO and many discerning educators in various countries, will be of practical value to the people of Iraq. In fact, unless the general receptiveness, understanding and cooperative spirit of the people are greatly quickened and stimulated by an educational campaign of this nature, the pace with which the country's development program can be carried out will seriously lag.

Magnitude of the Problem

[162] The proposed adult education campaign should be aimed primarily at those groups in the population which are beyond primary school age but are still receptive, namely those between the ages of 12 and 45 inclusive. On the basis of the census results available for the four provinces of Basra, Baghdad, Kirkuk and Mosul, it may be assumed that roughly 40 percent of the population are in this age group. In a total population of about 5,000,000 it may therefore be estimated that 2,000,000 should be reached by adult education. The number in this age group will gradually increase

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[3] Dr. Matta Akrawi, *Background Paper on Fundamental Education in the Arab World* presented to the Second United Nations' Seminar on Social Welfare in the Arab States, held at Cairo in 1950. Aside from this paper and the Report of the Committee on Rural Basic Education drawn up for this Seminar, a large amount of useful information on the aims and methods of fundamental education is available in UNESCO publications such as *Adult Education—Current Trends and Practices; Fundamental Education—Description and Program; The Use of Mobile Cinema and Radio Vans in Fundamental Education*, etc.

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with the growth of the population. On the other hand, several hundred thousand will be in areas too remote to be reached. Also, at least 10 percent are already literate. Thus an adult education program aimed initially at the eradication of illiteracy would have to reach about 1,500,000 people. 873

In these days when the methods and techniques of education and the various media of mass communication have become highly developed and efficient, it should be a manageable proposition to provide fundamental education for this number of adults within a reasonably short period. Unlike countries such as India and China, whose population is of an entirely different order of magnitude, the problem in Iraq can be tackled satisfactorily and expeditiously if the government and the Ministry of Education are really keen about it and they set about to win popular support in the right way. The ground will, of course, have to be carefully prepared. This will by no means be an easy task. Public apathy will have to be overcome, and the scattered and nomadic character of the population, the poverty of the people, the inadequacy of transport facilities and the insufficiency or inefficiency of the teaching personnel will have to be taken into account. It will, therefore, be desirable to formulate detailed plans carefully, to prepare the necessary material, to train the staff, to establish an adequate supervisory organization and to adopt an imaginative approach for mobilizing public opinion in favor of such a movement through all the resources of traditional as well as modern media of mass communication. For instance, in the case of the Bedouins, to whom the religious approach is likely to appeal, it would be advisable to secure the cooperation of their mullas. This would not be difficult because there is material in the Koran and the Traditions of the Prophet which clearly enjoins upon all believers the acquisition of knowledge and education.

In most countries where campaigns of adult education have been undertaken without the proper education of public opinion, they have tended to fail. They started with great enthusiasm because of some temporary stimulus but, for lack of proper follow-up, they were not able to win public cooperation. It is, therefore, essential that the movement be organized as a national crusade against illiteracy and the other factors which hinder the develop-

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ment of the masses to their full stature as democratic citizens. This will only be possible if, on the one hand, there is close and cordial cooperation between official and nonofficial agencies and, on the other, close, well-organized interdepartmental cooperation. Such cooperation, though always assumed in theory, is very difficult to secure in practice. The government can, however, facilitate it by various measures, including the establishment of advisory councils consisting of representatives of various ministries and departments concerned as well as of nonofficial organizations. The village school will form, as suggested later, the focal point for the cooperation of all local departmental officers in the work of fundamental education.

An education program of this nature can be launched and carried out successfully only if a special department is established for this purpose. The Mission therefore strongly urges the establishment of a separate Division of Fundamental Education within the Ministry of Education and the appointment of a person with vision, ability and enthusiasm to head it. The Division would, of course, need to have the fullest cooperation of all other divisions and departments in its work. It has at times been suggested that there should be a Directorate of Mass Culture in the Ministry dealing with all the activities bearing on mass education—adult centers, libraries, radio, music, art, cinema, etc. The difficulty in implementing the suggestion would be to find persons of such many-sided ability and interests as would be able to shoulder that responsibility. There might also be a danger that the more urgent and specific issues of fundamental education would take a secondary place in such a program. In any case, there is no doubt whatever that there is need to insure that these various agencies pool their resources and pull together instead of pulling in different directions.

Stages in the Development of the Plan

The Pilot Project

The first step in the developing program of fundamental education should be the organization, in some suitable locality, of a Pilot Project which will draw upon the services of the best local educators and secure the help of such outside experts as may be required. It should give special attention to the following points:

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1. Preparation of a group of selected teachers and trainers for work in the field of fundamental education. To develop the project on right lines and provide necessary training facilities, the project should "adopt" a suitable village or group of villages where, in cooperation with the local community and the government departments concerned, teachers under training and the local school teachers may actually carry on fundamental education among the villagers. The village would thus become a kind of practical laboratory where teachers would try out the lines and the techniques of work which they were learning in the center. Health officials and agricultural experts should be associated with the teachers in working out a broadly based program which will make the adults see and feel from the outset that the educational effort is really related to the practical problems of their life.

2. Preparation of suitable materials of all kinds—primers, books, folders and visual aids like pictures, charts, maps, wallpapers, films and film slides. Such material has been prepared in many other countries, for example, India, Mexico and China, and can be usefully studied and adapted, if necessary, to local needs. UNESCO has by now acquired a good deal of experience in this field and should be able to give valuable assistance in the organization of this project. In fact, useful work was initiated in this direction by the Second United Nations' Seminar on Social Welfare in the Arab States held at Cairo in November 1950. The UNESCO has also recently sent to Iraq a team of experts under Dr. Harold Allen with a similar program and objective. It carried on its preliminary work in the Dujaila area where a significant land development scheme is at present under operation. After this team (which worked in Egypt as well as Iraq) has completed its work, there is to be a seminar or a conference in which its results and projects are to be examined. It is hoped that the project will result in the establishment of a permanent Regional Center for Fundamental Education in the Middle East and that this Center will, among other things, organize and assist in the production of useful literature and other materials.

3. This period of experimental work on the Project, which may cover about two years, should also be utilized for:

   (a) carrying on an intensive campaign in favor of fundamental education in order to prepare the ground for its introduction on a national scale—students, teachers,

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873 influential local and national leaders, religious heads, all cooperating to prepare the public mind for the launching of this scheme;

(b) selecting suitable localities and deciding the order in which the scheme is to be introduced in those localities;

(c) conducting local surveys to assess the nature and magnitude of the work in each community or locality;

(d) preparing the material and translating it into different regional languages and adapting it to the needs of different regions;

(e) taking groups of teachers for short visits of observation and orientation to the project center; and

(f) introducing the principles and practice of fundamental education in the syllabus of training colleges and refresher courses for teachers.

Setting up of Model Centers

When the Pilot Project has been successfully worked out and the necessary materials, resources and techniques are available, a beginning should be made with introducing fundamental education in selected localities in different natural and cultural regions so that they may become models—even centers of pilgrimage for teachers and general public—for the whole of that area. Each center can become a powerful agency of propaganda and its success will insure that every successive center will find its work smoother and easier.

Conversion of Existing Schools into Community Centers

After the twofold experimental stage has been satisfactorily completed, the next phase should consist of gradually converting all existing schools into community centers which may serve as schools for children in the daytime and as social centers for adults in the evening. This will not be an easy transformation by any means because it involves a radical change in the traditional conception of the school and in the teachers' approach to their work. To aid the process the following measures will be needed:

Careful reorientation of teachers' outlook and short refresher courses and group conferences to train them in the new type of work;

Preparation and distribution of brief, well-written leaflets, brochures and visual aids to teachers to add to their knowledge and keep their enthusiasm alive;

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Provision of the necessary minimum of additional equipment required by the schools for conducting the social centers; 873

Adequate supervision of the centers through the employment of additional inspection staff, if necessary; and

Arrangements to insure that the rural officers of relevant government departments use their appropriate publicity material and their visual education apparatus, if any (projector, radio, gramophone, charts and pictures), at these centers so that they become the natural focal point for the educational work done by all departments. This should apply specially to the departments dealing with health, agriculture, irrigation, cooperatives and local administration.

The work is not entirely new and has been attempted, in different forms, in many countries. Moreover, the technical help given by the UNESCO and the experience gained in the Pilot Project centers should provide the guidance necessary to orient the work in the right direction. It is, however, essential that each step should be a firm step which will not have to be retraced because it was taken without sufficient thought. In order to assure this, it would be wise at the outset to choose a few schools in each province with competent, enthusiastic and conscientious teachers, to organize them as community centers and use each as a model and observation center for teachers in the neighborhood. In this way, the movement will gradually spread outwards and, within about 10 years—the exact period depending on the success of the pioneering schools—it should be possible to use most of the existing schools as community centers.

An attempt should be made, wherever possible, to add a hall to the village school which would not only provide an evening center where adults could meet but would, in many cases, also prove a boon for the day school itself. In many cases, the hall might be constructed through cooperative local effort and local subscriptions. Villages and small towns may even, in the course of time, come to compete with one another in constructing commodious, simple and attractive halls, equipped with the necessary furniture for this purpose. Where this is not feasible, the government should include the construction of such halls as part of the building program. The new schools that are established for primary education should be designed from the outset as combination school-

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community centers and this idea should permeate their buildings, their equipment and their staffing. It will mean a modified and improved school plan, and the inclusion in the school equipment of material that may be useful for adults. The whole organization of the school and its timetable should be so formulated that this work with adults will not be regarded as an extra burden or an afterthought but will become an integral part of the educational function of the school. Even if this means giving the school an additional teacher, it will be both worthwhile and economical in the long run.

The time schedule of the program, which should be carried out irrespective of changes in administration, is difficult to establish because it will depend on a variety of factors which cannot be forecast. It is suggested that the target be to bring fundamental education, including literacy, to virtually all the adults in the proposed age groups within a period of 20 years, i.e., the same period set for the complete introduction of compulsory, universal education. It is therefore proposed to establish 1,500 adult education centers in accordance with a schedule which would make it possible to reach almost 1,500,000 adults during this period. Of this total period, approximately the first two years would be required, as suggested above, for the Pilot Project and the preliminary work; the next three years would be used to convert about 10 percent of the schools, i.e., 120 selected schools, into community centers; and in the following 10 years nearly all the rest of the existing schools would be brought into the scheme. The final period of five years should be utilized for extending the program to more remote and inaccessible regions and to less receptive groups and communities. Thus the suggested time schedule for the program would be as follows:

1952-1953: Pilot Project
1954-1956: Establishment of 120 centers in selected schools
1957-1966: Establishment of centers in all the other schools
1967-1971: Completion of the program.

The Organization of Centers

How are these centers to be worked and staffed? It would probably be best to use school teachers and senior school students for this purpose. Unfortunately there are no large, well-organized

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voluntary social agencies in the country today which could take up this work. It is, therefore, suggested, as a practicable measure, that the school as a whole should be responsible for running these community centers for fundamental education—each primary or intermediate school being required to conduct at least one center in its neighborhood and each secondary school (with five classes) at least two such centers. This would mean, in effect, that different teachers of the school will take the responsibility of the work in turns so that no single teacher is burdened with it throughout the year. For instance, if one group of adults takes about four months to acquire training in literacy and useful knowledge, one particular teacher may see that group through its period of education and another teacher may take over from him when the next group comes in. While one teacher (or two in some cases) may be directly responsible for the day-to-day teaching, other teachers and senior students can, and should, be required to help in a variety of ways—giving occasional talks about health, social hygiene, civics and popular science; organizing discussion groups; reading newspapers, stories and poems; and showing charts, pictures and diagrams with suitable comment. This will not only lighten the work of the teachers in charge and broaden the scope of adult education into fundamental education, but also provide a welcome variety of approach and outlook for the adults and thus hold their interest better.

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With the school used as a center of activity by both adults and children, it will be possible to make the school a really dynamic element in the development of the community. This objective was envisaged over 20 years ago in the *Report of the Educational Inquiry Commission,* headed by Dr. Paul Monroe, which visited Iraq in 1931:

> ". . . The modern school seeks to emphasize the total life of the entire community. It aims to teach all members of the community how to keep well and prevent diseases, how to make a better living in their own community, how to make interesting and wholesome use of their leisure time, how to increase and enrich their opportunities for participating in socially useful activities. These are some of the outcomes that may be reasonably expected from the proper and suc-

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873 cessful unity of the school and the community in this most important educational task of improving the quality of life among all the people."

Financial Implications of the Introduction of Adult Education

It is difficult to work out the financial implications of this scheme because there are hardly any tested data to go upon and the progress of the scheme itself depends on a variety of factors which have been indicated. The main items of expenditure would be:

The establishment of a Division of Fundamental Education at the Ministry with adequate staff and resources for its functions as outlined.

The cost of continuing the Dujaila Pilot Project (whether it is met from UNESCO funds or the national budget).

The cost of conducting about 1,500 centers to be organized in the schools.

The cost of a follow-up program.

The first two are comparatively small items for which provision should be easily possible through the normal expansion of the educational budget. The third item could involve considerable expenditure. However, the cost should not be too great if, as has been suggested, existing schools are used and the services of their teachers and senior pupils are made available on a voluntary basis. The teachers and senior students, who assist in the conduct of adult education centers, should be encouraged and expected to work primarily from a spirit of social service. The chief expenditure for staffing the center would thus be the payment of a small honorarium, perhaps five dinars per month, to the teacher (or two teachers in the case of larger centers) who will be directly responsible for supervision of each center. In addition, it will be necessary to provide for each center some necessary equipment as well as books, charts, pictures, and other materials, and to meet the cost of lighting in the evenings when it will usually be functioning.

The fourth item will cover the cost of a number of fully equipped mobile vans (which may be partly met out of the funds made available by one of the international technical assistance programs), the preparation of audio-visual aids, the publication of

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suitable literature for adults and guide books for teachers, the establishment and maintenance of village libraries and other agencies for stimulating and keeping alive the interest in reading, and other educational, social and useful practical activities, initiated through the community centers. 873

In working out the total cost of this program, it is necessary to indicate separately the expenditure that will be incurred in the first five years and the total expenditure to be incurred in the following period of 15 years.

During the first two years, the only expenditure will be on the Pilot Project and the establishment of a Division of Fundamental Education in the Ministry. For these, provision can be made, as suggested, in the normal budget of the Ministry without any difficulty. During the next three years, it is suggested that 120 model centers be opened at the rate of 40 centers each year. Each center will involve a recurring expenditure of about 60 dinars per year on the teachers' honoraria and about six dinars on lighting. The expenditure on equipment may be put down at about 30 dinars, on a nonrecurring basis—a modest figure, because it is proposed to make use of school equipment and furniture so far as possible. Moreover, it is expected that, as the community center wins the loyalty and goodwill of the local community, its members will provide funds, through voluntary contributions, for improvement and extension of facilities and for occasional replacement of materials. So far as the follow-up program is concerned, it will be necessary to make suitable provision for it from the very beginning in order to insure that adult education will be a continuous process and not primarily a three-months' literacy course followed by a relapse into illiteracy and cultural apathy. As each group of centers is started, a follow-up program will have to be organized, and provision at the rate of ID 2,000, 3,000 and 4,000 in the first three years, respectively, has been proposed accordingly. During the three years, 1954, 1955 and 1956, the cost will thus work out as follows:

Teachers' honoraria	ID 14,400
Lighting charges	1,440
Follow-up program	9,000
Equipment of 120 centers	3,600
	28,440

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873 Thus the total expediture on these centers within the next five years will be within ID 30,000. Table 1 shows the number of centers proposed to be opened during the following 15 years, the recurring and nonrecurring cost of these centers, the cost of the follow-up program and a rough idea of the number of persons who might be made literate by the program. The latter number is calculated on the assumption that a period of three to four months will probably be sufficient to achieve literacy and that each center might therefore be expected to make three groups of 30 to 40 adults literate in each year. If experience shows that this period is not sufficient, the number of adults expected to be educated will be reduced and the calculations made will be correspondingly affected. It should, however, be borne in mind that these calculations are based on the assumption that only 1,500 such centers will be functioning. Actually, it has been suggested—and it is to be expected—that many voluntary agencies will, in due course, cooperate to set up centers of their own, and most of the new schools to be opened will be combination schools and community centers from the outset. Thus, even if the centers cannot work with the full efficiency expected of them, it should not be difficult, with the help of these

TABLE 1

PROJECTED NUMBER AND RECURRING COST OF CENTERS OF FUNDAMENTAL EDUCATION

(in dinars)

Year	No. of centers	Teachers' honoraria and lighting	Follow-up program	Adults made literate
1957	220	14,520	8,000	22,000
1958	320	21,120	10,000	32,000
1959	420	27,720	12,000	42,000
1960	520	34,320	14,000	52,000
1961	620	40,920	16,000	62,000
1962	720	47,520	18,000	72,000
1963	820	54,120	20,000	82,000
1964	920	60,720	22,000	92,000
1965	1,020	67,320	24,000	102,000
1966	1,200	79,200	27,000	120,000
1967–71	1,500	495,000	165,000	750,000
	Total	942,480	336,000	1,428,000

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additional centers, to bring about an almost complete eradication of illiteracy within the period specified. 873

Thus it may be tentatively estimated that the total recurrent cost of adult education as scheduled in the above table would amount over 15 years to ID 1,280,000, to which a nonrecurrent cost for equipment estimated at ID 45,000 would have to be added. If the expenditure for the initial five years is also taken into account, then the total cost of the 20-year adult education program will be approximately ID 1,355,000. Even if the total reaches ID 2,000,000, the cost cannot be regarded as a high price to pay for the virtual eradication of illiteracy among the adult population and the inauguration of a broad program of adult education.

IV. Agricultural and Technical Education

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The need for and urgency of a program for the improvement of agricultural and technical education has been stressed elsewhere in this report.[4] Such a program for technical education may, however, prove wasteful and disappointing unless it is planned intelligently at every stage with reference to the developmental needs of the country and steps are taken to insure that its qualitative standards are high. A competent specialist should therefore survey the whole field of agricultural and technical education in order to determine the adequacy of present facilities and the need for trained technical personnel during the next 10 years in the light of the total development program projected by the government. It is understood that UNESCO is providing specialists for this purpose. It is important that these specialists be enabled to obtain some idea of the total requirements in the field of technical personnel, the number of such persons available in different fields at present, the need for additional personnel, the policy to be followed in training Iraqi technicians in the country and abroad and the extent of the need for foreign technicians to meet immediate needs. In view of the limited size of the country and the fact that technically educated persons are almost all to be found in

[4] See Annex C, *Agriculture and Animal Husbandry*, pp. 251 *et seq.*, and Annex D, *Industry*, pp. 297-8.

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874 Baghdad or the larger cities in the province, either employed by the government or by a few well-known technical concerns, it should not be difficult to ascertain how much scientific manpower is actually available. Similarly, it would be comparatively simple to assess the needs of additional technical personnel in the various fields when the projects of development to be put through during the next 10 years have been finally selected.

While detailed recommendations for the reorganization of technical education will be made by these specialists, a few important points which should be taken into consideration in formulating a policy are noted here.

There can be no improvement in the standards of technical education or in the efficiency of trained students, unless general school education is made more practical from the earliest stages and is given an increasing vocational bias in the intermediate and [461] secondary schools. The Mission received evidence from all quarters that there was a general lack of enthusiasm, if not actual antipathy, for manual work on the part of the students, whether trained in general or technical schools. When students from these schools go to technical institutions and take their diplomas and degrees, they are anxious to get government jobs where they can act as "bosses" and "officers" and they fight shy of manual jobs whether on the farms or in the factories and machine shops. There is nothing either in the psychology or the religious and ethical traditions of the Arab race to justify such a mentality. As a tradition of the Prophet of Islam has it: "Al-Kasibo Habeebul-lah," which may be translated as "He who earns his living (by the sweat of his brow) is a friend of God." Eradication of this aversion to manual work should form an important objective of educational policy at all stages.

It is certain that, in view of the proposed technical development, a much larger number of technically trained young men will be required in the coming years and technical education will need to be strengthened both quantitatively and qualitatively. There is fairly general agreement on the part of those who are familiar with the existing technical schools that the training they provide is neither sufficiently practical nor closely enough related to the conditions that obtain in the factories and the market. The result is

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that most of their graduates are not equipped to set up a workshop or business of their own or even to find useful employment in established private business. Instead, most of them hanker after government jobs or clerical positions in banking and commerce.

The total number of students in all technical institutions at present is a little more than 750. This is very small both in relation to the total population and the growing technical needs of the country. Moreover, so far as the Mission could discover, many technical graduates are not being fully utilized in types of work for which they are qualified. This represents a source of wastage which can be avoided partly by better coordination between technical schools and technical occupations, and partly by placing more stress on practical training in the schools. In expanding the existing facilities, provision must presumably be made for (1) the training of full-time students, and (2) supplementary training of promising workers selected from factories and workshops. In the latter case the course will need to cover not only the kind of technical knowledge best imparted through classroom instruction but also any deficiencies in formal education such as reading, writing and mathematics. In both cases the practical training with tools, machinery and other types of equipment should be given in well-equipped workshops like those of the railways and the Iraq Petroleum Company. Technical education should therefore be planned jointly with the management of such shops, and a system of apprenticeship should be instituted in all factories and on construction projects.

The State has sent about 780 candidates for study abroad during the last 10 years. It will no doubt be necessary to continue this policy for some years but it should be carefully reviewed in the light of the developing needs of the country. The Mission would urge three points on the attention of the government in this connection. First, the availability of training facilities abroad should not delay establishment of such facilities in Iraq, particularly for the training of people at what may be called the intermediate level. Local technical institutions should give special attention to training foremen and supervisors who would act as intermediaries between the highly trained engineers at the top and the semiskilled or unskilled labor. There is a general com-

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874 plaint regarding the paucity of this type of trained foreman and it may well be regarded as the weakest link in the technical force available to the country. In this connection it would be advisable gradually to raise the standard of qualifications prescribed for direct entrance to technical schools. While arrangements should certainly be made, as already suggested, for part-time training—in evening classes—of selected factory workers who may have low academic qualifications, there is no reason why semiliterate candidates should be admitted to full-time training in the technical schools.

Second, the Mission suggests that, in selecting candidates for foreign training, an effort should be made to take an adequate proportion from among those who have actually worked in factories and workshops and have given evidence of practical skill and capacity, provided, of course, they possess the requisite qualifications for admission. The training of such candidates is likely to prove more useful to the country, in some ways, than that of graduates fresh from technical institutions who may seek foreign training chiefly in order to secure government jobs.

Third, programs for technical training of Iraqis both at home and abroad should be worked out in consultation with the Development Board. The latter will need to determine the technical manpower requirements and make sure that training schemes are focused in the first instance on satisfying these requirements.

Finally, the Mission would like to stress the great importance of giving agricultural education its proper place not only in the field of technical education but also in that of general education. Agriculture is, and will continue to be, the main industry of the country. It will not be possible to improve the conditions of the rural population unless productivity is increased, and, through education as well as agricultural extension work, the adults and the younger generation are made increasingly conscious of the importance and dignity of farming as a profession. It should be the function of schools, adult centers and agricultural extension work to bring accurate and fruitful knowledge about better methods of agriculture and allied subjects to the cultivators in the countryside and the children who are being educated in the schools.

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V. Administration

It is an obvious truism that no educational policy or program can be implemented with any chance of success unless there is reasonable stability in the administration and approved schemes are carried on without being affected by ministerial changes and the varying fortunes of party politics. Such, however, has not been the case in the country during the last few decades. There have been quick changes not only of government but also, and in consequence, in the higher administrative personnel of the Ministry of Education. It has been calculated, for instance, that during the 18 years between 1927 and 1945, there were 14 different Directors General of Education, although the post is supposed to be permanent and the person in charge is expected to work as the head of the administration. The Departmental Committee which formulated the Ten Year Plan has itself rightly and courageously drawn attention to this distressing situation; its report points out that frequent changes of Ministers has led to instability in personnel and programs and that officials at the Ministry have often been too weak to defend programs and policies before successive Ministers who wished to make changes before they had been long enough in office to study the needs of the situation carefully. The Mission believes, therefore, that the government should take immediate steps to insure that there is reasonable stability of administration in the Ministry so that, once basic educational policies and programs are approved, they are not subject to change without mature consideration. In order to secure this objective, the following measures relating to the operation of the Ministry of Education are put forward:

1. A statutory Board or Council of Education, consisting of appropriate officials and nonofficials conversant with different types of educational problems, should be established to assist the Ministry of Education in the formulation of educational policies and programs and to guard against the possibility of hasty and ill-considered changes or the abandonment of approved programs. If the Board is created by statute, its constitution and personnel will not be easily upset as an incident of changes in the Ministry.

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2. There should be a permanent secretary in continuous charge of the Ministry and reporting directly to the Minister. He ought to be a qualified and experienced educator who would serve as a connecting link between successive Ministers and thus help to assure reasonable continuity of policy. The government might consider whether to merge the existing position of Director General of Education with that of permanent secretary or to have two separate positions. In any event, the present arrangement, under which separate and independent Directors General of primary, secondary and higher education work directly under the Minister, is administratively and educationally unsound and makes integration and coordination of educational effort extremely difficult.

3. An effort should be made to build up within the Ministry a body of competent educators, possessing vision and enthusiasm as well as experience, and enjoying reasonable security of tenure, who would specialize in different aspects of education. They should be able to speak with authority and confidence in their respective fields and guide and advise teachers in all types of schools. If they are to do so, it is essential that they be relieved of much of the petty administrative detail which at present hinders them from devoting themselves to larger issues. This would involve a certain amount of delegation of power to local educational officers, which would need to be carefully worked out but which is sound in principle.

4. It is certainly desirable to associate local administration and influential local persons with the working out of the program that the Mission has recommended. Such association will go a long way to stimulate public interest and cooperation in education. The Mission is, however, of the opinion that, at this stage, this assistance should be enlisted chiefly in an advisory capacity and that the over-all direction and supervision of the new and far-reaching educational reforms and measures should remain in the hands of the Ministry for the present. The Mission strongly questions the wisdom of the steps recently taken to entrust the provincial councils with the responsibility for primary education. Experience in other countries has shown that a sudden devolution of authority to local administration may lead to serious complications and difficulties and endanger the success of the entire program. This should not be taken to imply that many of the functions and powers which are at present exercised by the officials at the center need not be delegated, say, to the

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Directors of Education. It is meant rather as a warning against transferring the supervision and control and the general responsibility for compulsory or adult education to local bodies or officials who have had little or no experience in dealing with such problems.

The people in each locality should unquestionably be given a sense of participation in the educational effort. The Mission has already stressed the importance of enlisting local support for the introduction of compulsory primary education and the inauguration of adult education. Local participation can take the form of voluntary self-help through the provision of free midday meals, books and stationery, or shoes and clothing to needy children, improvements in school equipment and school gardens and the like. Local self-help in constructing or adding to school buildings should also be encouraged.

VI. Conclusion

The Mission has considered already the financial implications of the educational program and has expressed the view that it is within the resources of the state—actual and potential—to undertake the suggested program of educational expansion and reconstruction. It trusts that the government will definitely adopt the view that increased expenditure on education is a long-range productive investment likely to give the country a generous return in the form of a more prosperous, cooperative, socially conscious and enlightened population. This return is no less real, though less tangible, than those that may be expected from investments in industry or even agriculture. Thus it requires courage and vision to make a large investment in education, for the purpose not only of multiplying schools, but also of raising the quality of education they provide.

The Mission's approach in the educational field is founded on the conviction that education is one of the most important means of raising production levels and living standards and thereby assuring the economic health of the country. It is for this reason that the Mission has given it a high priority in its recommended projects for development. If national development is to be balanced and har-

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monious, measures for the improvement of health and the provision of better educational facilities—which have a more direct impact on production than in more developed countries—must be given their proper place. In underdeveloped countries, it would be most unwise to invest the bulk of the national resources in large industrial and agricultural projects while ignoring the need for developing social services essential to the mental and physical health of the people.

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TABLE I

Projected Student Enrollment Under the Compulsory Primary Education Program: 1956-1968

(In thousands)

Class	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968
I	22.5	45.0	45.0	45.0	45.0	45.0	67.5	90.0	90.0	90.0	90.0	90.0	112.5
II	....	22.5	45.0	45.0	45.0	45.0	45.0	67.5	90.0	90.0	90.0	90.0	90.0
III	....	....	22.5	45.0	45.0	45.0	45.0	45.0	67.5	90.0	90.0	90.0	90.0
IV	....	....	....	22.5	45.0	45.0	45.0	45.0	45.0	67.5	90.0	90.0	90.0
V	....	....	....	....	22.5	45.0	45.0	45.0	45.0	45.0	67.5	90.0	90.0
VI	....	....	....	....	....	22.5	45.0	45.0	45.0	45.0	45.0	67.5	90.0
Total	22.5	67.5	112.5	157.5	202.5	247.5	292.5	337.5	382.5	427.5	472.5	517.5	562.5
Cost in thousand dinars	180.0	540.0	900.0	1260.0	1620.0	1980.0	2340.0	2700.0	3060.0	3420.0	3780.0	4140.0	4500.0

Notes: 1. The duration of the primary course has been taken to be six years.
2. The average annual cost per student in a primary school has been assumed to be eight dinars.

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TABLE II

Projected Student Enrollment in Teachers' Training Colleges: 1953-1957

(in thousands)

Class	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
I	.75	1.50	1.50	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	....	....
II	....	.75	1.50	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	....
III	....	....	.75	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Total	.75	2.25	3.75	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	3.0	1.5
Cost in thousand dinars	52.50	157.50	262.50	315.0	315.0	315.0	315.0	315.0	315.0	315.0	315.0	315.0	315.0	210.0	105.0

Notes: 1. The period of training is taken as three years.
2. The average annual cost per student at a teachers' training college has been assumed to be ID 70.

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ANNEX H

COMMUNITY PLANNING AND COMMUNITY FACILITIES

I. Introduction

In its main report the Mission has expressed in general terms its view that more attention needs to be given to the problems of community planning and housing. Well-planned communities and a well-housed population are clearly desirable social assets; but it may not be so generally realized that they are also economic assets. The extra cost of good design and careful planning is small compared with the waste that ensues if they are ignored. In purely financial terms it is costly to maintain, and far more costly to improve, a city which has extensive slums and congested streets and whose growth does not follow lines that permit the provision of efficient public services.

The Mission has advocated the strengthening and improvement of the Planning Office of the Directorate General of Municipalities in the Ministry of Interior to take care of community planning, both rural and urban, and of the Housing Section attached to the Department of Labor in the Ministry of Social Affairs to take care of housing in all its phases. It believes that these related agencies should ultimately be developed into a genuine Community Planning Office and a central Housing Authority with separate and well-defined functions and with the power necessary to discharge those functions effectively and adequately. As a technical supplement to the Housing Authority, the Mission has recommended the establishment of an Applied Building Research Station which would conduct research on improved methods of construction and on the new use of available building material and, as such, would most suitably be attached to the proposed Department of Research and Standards in the Ministry of Economics. The broad functions of these offices have been described in the main report.

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447 361 In this Annex it is intended to describe more fully their functions and the principles which should guide them and to illustrate this description by reference to particular conditions in Iraq. It may, however, be well to note at the outset that the men [464] needed to discharge the functions of these offices adequately will have to be trained, as there are very few now in Iraq who have even part-time training in community planning and housing. The sooner a start is made, the quicker the offices can be built up. Promising men, who have had some experience, could be sent abroad for further training and experience. In Iraq, courses on the subjects might be introduced into the engineering and architecture curricula for those who intend to pursue a career in either of the two new government offices. Initially, it might be necessary to employ an experienced foreign technician to give these courses and to act in an advisory capacity to the government.

000 ***The Functions of Community Planning and Housing***

Community planning is the process of effecting the orderly layout of a community and the continuous improvement of that community for the physical, economic and social welfare of its residents. It involves the task of thinking ahead so that proposals may be appropriate, timely, and based on factual analysis in the light of the objective sought. In an industrial community, for example, it would mean, after a survey of conditions, preparing a plan which would allocate various sections of the land to the category of use, industrial, business, residential, recreational, and so forth, for which they are best suited, considering the needs and existing facilities of the community. At all times, consideration has to be given to the future growth of the community, both in relation to the existing development and to the bigger metropolitan area or region of which it is a part.

Housing is not as broad a field as community planning, but the two are closely related, especially as housing affects the standards and development of residential areas. Housing has for its goal the most effective utilization of available resources for sheltering for the people and providing for them, or helping them to provide for themselves, the facilities and services for pleasant living. This involves the analysis of the composition and characteristics of the population, the determination of their ability to pay for hous-

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ing, the study of feasible methods of financing, the improvement of the quality of house designs and of methods of construction to fit the needs and pockets of the people, and the operation of rental housing projects. It may be mentioned that housing involves more than merely the design and construction of houses; it involves, too, the design and development of accessory facilities for community living. At this point the functions of housing and that of community planning meet.

There are several principles which are fundamental in both these spheres. The first is the need for coordination. The Mission has already touched on this in the main report in a more general discussion of government administration. The importance of coordination in dealing with communities where all aspects of economic and social life are united is clear, but, as will be seen subsequently, there is much room for improvement. The Community Planning Office recommended by the Mission should be the center for the coordination of the work of all Ministries insofar as their activities affect community life. As such, it should be empowered under an appropriate enabling act to issue regulations that would insure adequate coordination; and it would be greatly helped in its task if the Development Board were to insist that all schemes presented to it, which would affect community planning significantly, should be referred to the Community Planning Office.

A second principle is that planning should be integrated. A community must be treated as a whole. When problems such as excessive traffic congestion in certain streets or on river bridges arise, it is important that they be treated not as isolated difficulties, but as problems affecting the planning of the whole city. Solutions that might appear most expedient for the particular problem are apt to be expensive in the long run. In contrast to piecemeal planning of this kind, farsighted planning can deal with problems before they become acute.

A third principle is that planning should not be simply imposed from above. On the contrary, every effort should be made to encourage the people to improve their own lot and to provide intelligent advice to guide their efforts. Planning should be not only for the people but should enlist their participation. In this

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connection, the method of "aided self-help" which has already been referred to in the main report can be a very useful tool.

Basically, this method is a very simple one. Whenever a group of people, a small village community, for example, wishes to carry out a project for the common good but lacks the means or the knowledge to do it, the government might agree to supply a few of the essential manufactured materials in return for an undertaking that the people will supply the labor by working on the project under the supervision of a government technician. This method has been successful in many parts of the world and can be applied to a variety of projects, such as housing, village dispensaries, and drinking places for cattle or dams across small streams.

Beginning with simple projects, the people will, as experience is gained, be able to undertake more complex projects of improvement. One of the objectives in stimulating the people to build for themselves and on their own initiative is to give them pride in their accomplishment and the will to maintain what they have built in good order. And this can be done at a minimum cost to the government in money and, what is perhaps more important in Iraq, at a maximum saving in the time of trained employees. The force of example often leads neighboring communities to embrace with enthusiasm similar methods of improving their conditions.

The function of community planning and the principles behind it apply equally to all types of communities, although their application may vary from case to case. In subsequent sections the rural and urban communities are described and their problems discussed separately for the sake of convenience. Although there is a wide gulf between the typical small village and the larger cities, the distinction is to some extent arbitrary, there being little difference between the larger villages with 1,000 to 2,000 inhabitants and the smaller towns with about the same population. Apart from this, it is important to remember that the principles of good planning, as distinct from the details of their application, are the same wherever they may be applied.

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II. Rural Communities

About one third of the people live in towns and cities; of the remainder, a small proportion are nomads and the bulk live in villages. In terms of population, therefore, the villages are the more predominant type of community. Although the distinction between a village and a small municipality is, as already noted, somewhat arbitrary, even the smallest municipalities are centers of local administration and have certain facilities of a higher standard than the villages. The distinction will, in any event, serve for present purposes.

Virtually all the rural population live in villages, isolated dwellings being very rare. Landowners, in fact, frequently count their fellahin by villages. Except for the extreme northwest, where there are seminomadic pastoral tribes who live in settled communities for only part of the year, the inhabitants of the villages are mainly cultivators. A few members of the community may have other occupations such as the tending of sheep and goats, the keeping of small shops and coffee houses or the building and repairing of huts. There are, also, villages where a considerable number of the people are engaged in handicrafts (e.g. weaving) but these are rare.

In the North, stone is generally available and is the commonest material for buildings, while in the South and the Center, mud is the usual material. The mud plaster of walls is reinforced with straw or cow dung to minimize the washing of clay in the mortar when it rains and to prevent temperature cracks. Where the climate is drier and palm leaves or reeds are available, especially in the marshes and palm belt of the South, these materials are more extensively used.

Another feature which distinguishes the North from the rest of the country is the greater permanence of the villages. The main reason is probably that there is a much older tradition of settled cultivation than exists in the recently irrigated areas. Not only are there more small-holders, who would naturally have a close association with their land, but the fellahin also appear to have A GREATER SECURITY OF TENURE.

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361 a greater security of tenure. Other factors, which have no doubt affected the permanence of villages in some parts of the irrigation zone in central and southern Iraq, are the salination of the land and the silting of canals. In such cases, the fellahin have no choice but to abandon their villages.

In spite of these differences, however, the villages have a number of characteristics in common. The typical village is a cluster of huts huddled together without any orderly design. There are no communal facilities or open spaces for the recreation of the
342 children. The huts are so constructed as to keep out heat, cold and sandstorms at the minimum expense. Consequently, they consist of a single room with thick walls and a doorway, which usually opens on a small enclosed yard that is used for both cooking food and keeping draft animals. In order to avoid sand and sunlight, windows are either very small or totally lacking; sashes are expensive. Furnishings are limited to such elementary necessities as a mat and a plain table or a bench. Sanitary facilities, including latrines, are generally lacking.

312 The villages are necessarily located near a source of water, by a canal in the irrigation zone, by a stream or a well in the North. The water is not piped, but must be carried from its source to wherever it is used. Nor is it purified, although the canals in the irrigation zone may be heavily polluted. The water which has been used by men for washing and in which animals have immersed themselves while drinking is often used for human consumption. The constant trampling of the canal banks for these purposes leads to leaks and, hence, to stagnant pools near the adjacent village. Where the source of water is a well, the earth nearby may be dug out for use in the construction of houses and so, similarly, a
[364] stagnant pool may be the result. Such pools, combined with the total absence of any sanitary disposal of waste and garbage, constitute a serious danger to health.

361 Trees are rarely seen in the villages, although they would give
137 relief from the sun and from sandstorms. Trees would also pro-
244 vide firewood instead of the fuels currently used—animal dung, which could be used instead as fertilizer, and brushwood, which has to be gathered with considerable effort. Small gardens for vegetables are unknown. In fact, fruit and vegetables are almost

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exclusively grown by farmers who specialize in these commodities and who market their produce in the towns.

Planning the Improvement of the Villages

Clearly it will not be possible to bring about any substantial and lasting change in the state of some thousands of villages until the root causes of poverty, ignorance and insecurity have been tackled. Only then can thriving communities replace the present villages with their primitive and almost static mode of life.

Legislation for the improvement of villages is already in existence. In 1936, a law (No. 70) for the construction of new villages was passed, empowering the Ministry of Interior to construct or renew villages, having regard particularly to health requirements, such as the construction of sanitary facilities and public baths, the hygienic disposal of waste and the provision of drinking water. A draft law on similar lines, but placing the responsibilty on the Ministry of Social Affairs, was put before Parliament during 1951. Parliament sent it back to the Council of Ministers for amalgamation with the earlier statute. Both are admirable in objective, but both are focussed primarily on the reconstitution of villages on more hygienic lines without regard for the urgent educational and economic aspects of the problem and without recognizing the need to enlist the cooperation of the people. Only a comprehensive and popular program can really reach the people and encourage them to help themselves. That little, in fact, has been done under the 1936 law is itself eloquent testimony to this.

The task of remaking the villages is typically one for the new Community Planning Office. In cooperation with all the government departments concerned and with their advice, it should be able to formulate and issue the necessary regulations, of which those that affect health are only a part, under the power conferred on it by the projected planning enabling act.

The Mission has elsewhere made a number of recommendations designed to raise the standard of living of the rural population. On the agricultural side, these include the organization of an extension service, the creation of cooperatives, measures to improve livestock and the provision of better drainage. Medical recommendations include the opening of more village dispensaries, the

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361 distribution of household remedies and measures to control endemic diseases. In addition, the recommended Housing Authority could design huts which could be built cheaply, would allow light and air to come in and would still afford protection against the elements.

The Community Planning Office should initiate and regulate a program to remake the villages according to simple, workable plans which conform to these requirements of economic and social progress and which do not merely consist of a more orderly layout of the village with improved huts. There is little point in improving a village if drainage fails and crop yields begin to fall. Education, too, is of fundamental importance. An adult education program as recommended in Annex G, *Education*, could help people to cope more effectively with their practical problems and prevent what might have been a well-planned community from deteriorating into its old way of life. Provision should, therefore, be made for the needs of education and cooperation by building a community center which could serve both as a school and as a meeting place. Shade trees, wood lots which would serve also as windbreaks and, possibly, small gardens could be laid out in accordance with the agricultural department's recommendations. Simple storage of grain could similarly be provided. Stabling and drinking troughs for animals should be provided in cooperation with the health and veterinary authorities. Water supply and sanitary facilities will also have to be included in accordance with health requirements. These are merely examples of the desirable attributes of a village designed to better the living standards of its people.

The Application of Self-help

In view of the magnitude and the continuing nature of the program, it is vital that the will to recreate the villages come from the people themselves. Unless it does, little of lasting benefit will be accomplished. In this connection, the method of aided self-help would be particularly valuable, since there are great potentialities in the force of example, one village following another. But, to be effective, the examples will have to be striking and of practical value. The Mission suggests as one possible approach that, initially, a few villages be selected in different parts of the country and plans prepared for their improvement. An important element in this will be the choice of villages. The villages chosen should have an

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intelligent and capable *Mukhtar* (headman), to whom the benefits of the replanned village and the methods by which it will be improved can be explained. He should be selected only if he shows enthusiasm for the plan and can carry his village with him. If such a man can be found, he should be consulted frequently, not only to give a sense of participation both to him and, through him, to the people of the village, but also because the *Mukhtar* may well be able to give valuable advice. In areas where the people are fellahin, the chosen village should be on the property of a landowner with a genuine interest in his people's welfare.

Once the plans have been agreed upon, they could be explained in general terms to the people of the village and the schedule of work outlined. Work should start at a time of the year when it will not interfere with the normal pursuits of the people. The first project should be one of interest to the village as a whole, perhaps the school. As the monograph on education notes, there have already been cases where villages have demonstrated their willingness to build their own schools. It would also be important to undertake at an early stage projects of obvious practical utility to the village, such as a piped water-supply with a simple purification plant and a drinking place for cattle. Ultimately, a start should be made on the rebuilding of the huts according to a design or a number of designs prepared by the Housing Authority. Preferably, this too should be a cooperative venture, each hut being built not by one family, but by a larger group which would build in turn for each member.

If work on the initial group of villages can be successfully completed, the country should have at its disposal several well-planned and executed demonstration units, where the people themselves will be able to point to the benefits they have received, largely through their own efforts. To the extent that they are convinced that, as a result, they enjoy a higher income, better health and a more pleasant environment, other villages will become keen to follow their example. Eventually, the program might extend to one village in each *qadha*, then one in each *nahiya* and so forth.

One warning must, however, be made about such a demonstration program. It should not be too elaborate. The initial demonstration units should not be show-pieces in the sense that

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they are elaborate and expensive to construct, require a great deal of funds and official attention to maintain, and the benefits are generally beyond the comprehension and appreciation of the average villager. They should, on the contrary, be simple enough so that the villager can both understand the improvement and be anxious to undertake most of the work himself, and will continue to do so for other future improvements. Otherwise, the people of other villages will merely admire the demonstration units and will feel that model villages are beyond their attainment.

New Settlements

Nowhere has the government a better opportunity for the planning of good rural communities than in new settlements such as Dujaila. Settlement in Dujaila began in 1946 and it is clear that a considerable effort was made to give the community an improved layout. In May 1951, there were 1,058 cultivators settled in square lots of 100 donums each (500 by 500 meters). The portion of the Scheme which has been laid out has groups of four houses constructed at the adjoining corners of four lots.[1]

The cultivator is obliged by regulation to plant a garden of a specified area and to build his own house and those of his helpers within the unit under his possession. The Committee which administers the Scheme locates and determines the number of houses and decides on the period within which construction shall be completed. The houses are made of mud or mud bricks, and each consists of a bedroom, a living room, a storeroom, a kitchen, a bath, a water closet and a stable covering a total area of about 80 square meters; a staircase leads to the flat roof. There is also an enclosed courtyard of about 220 square meters which is used by both the family and its livestock. Separate entrances are provided for the people and the animals.

Although the Dujaila settlement is a great improvement on the average village, it has a number of defects. The present layout makes it possible for each cultivator to have his house and those of his assistants on his own unit, but it has spread the population sparsely over a wide area resulting in long distances to community facilities, such as schools and stores, and a lack of the

[1] See diagram on pp. 348 and 349.

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social life which compact communities provide. Although a club is maintained by a cooperative, only a few settlers patronize it because of its distance from their homes. Pure drinking water and sanitary facilities are not available and could only have been provided at great expense.

In future settlements these defects could be eliminated and the community pattern improved by a more social grouping of homes and a more accessible and convenient location of schools and other public facilities. The Mission has prepared an example of such a layout.[2] The land is divided into farms of 300 by 825 meters. A number of these farms combine to form a Rural Unit ("A") within which there is a Residential Group ("a") of 60 to 70 houses and gardens, each lot measuring 30 by 84 meters. Although not adjacent to their corresponding farms, they are within walking distance, yet far enough from the main irrigation canals to avoid pollution. The total area available to each farmer is thus about the same as in Dujaila. The houses are staggered in order that each may take advantage of its neighbor's gardens and avoid overcrowding of structures. Except for the front walls, the house lots and gardens are without solid fencing. Screens of trees or hedges may be used instead. Near the center of each Residential Group and easily and safely accessible to children are a small school and meeting hall and an open space which may be used for recreation; and adjacent to these are the local shops. A number of these Rural Units combine to form a Village Group. At its core is a Village Center with its larger open space, a school, a mosque, bigger shops and other facilities commonly associated with a Village Center.

This layout is, of course, intended only as a schematic illustration. Since it is designed for a particular size of individual farm, suitable modifications would have to be made for farms of different sizes. It might also be found desirable to alter other features, for example, the size of the village center in relation to the outlying residential groups or the distance between them. The most important consideration is that the design, as finally decided on, should be based on a thorough study of all the local conditions in the settlement and the needs of the people who are to live there.

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[2] See diagram on pp. 348 and 349.

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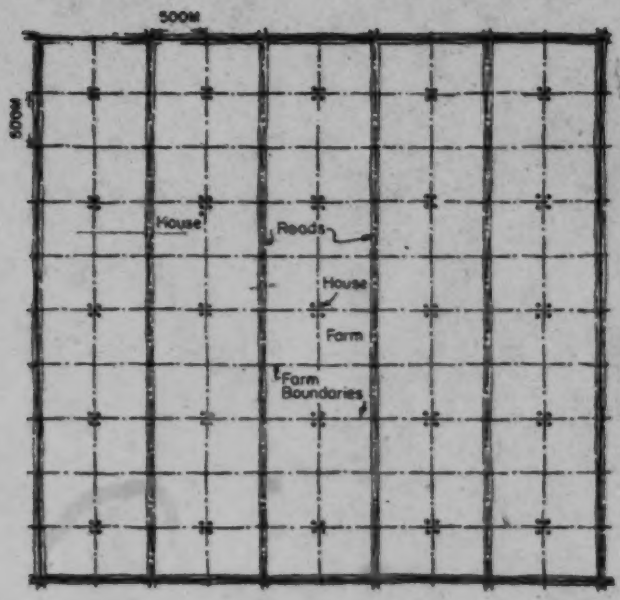
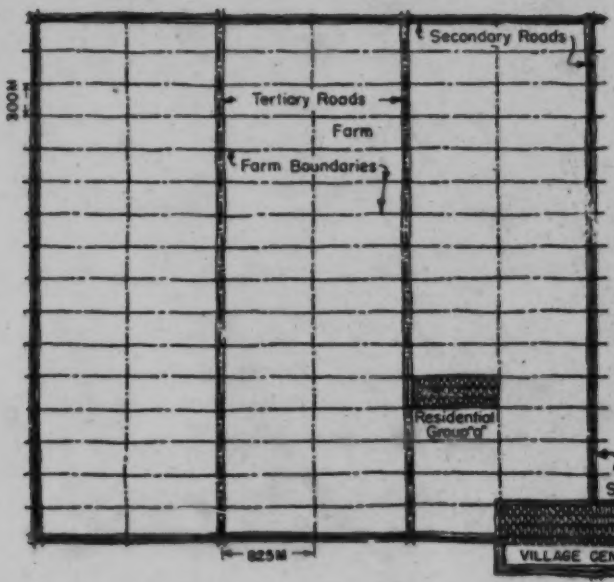


EXISTING LAYOUT

FARM AND HOUSE
500M x 500M =
250,000 SQ.M

100 FARMS IN THIS ARE, EACH PROVIDED WITH A HOUSE

HOUSES ARE IN GROUPS OF FOUR



RURAL UNIT
SUGGESTED LAYOUT

FARM
300M x 825M =
247,500 SQ.M

LOT AND HOUSE
30M x 84M =
2,520 SQ.M

TOTAL OF FARM, LOT AND HOUSE
250,020 SQ.M

LOT AND HOUSE =
10% OF TOTAL

94 FARMS & HOUSES

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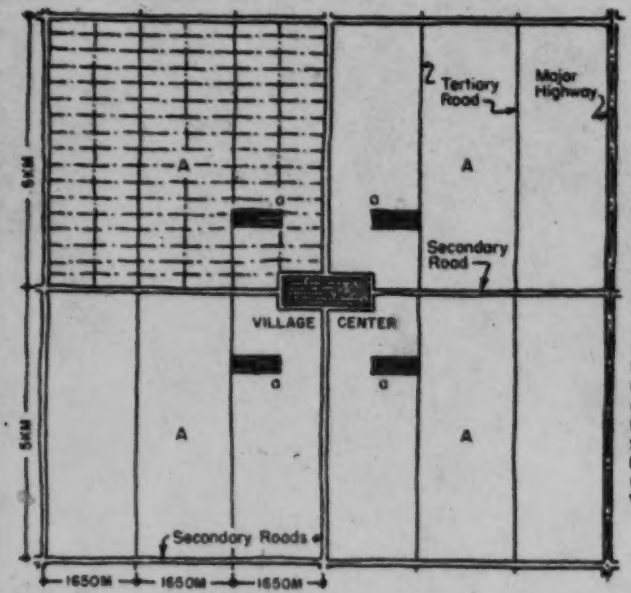
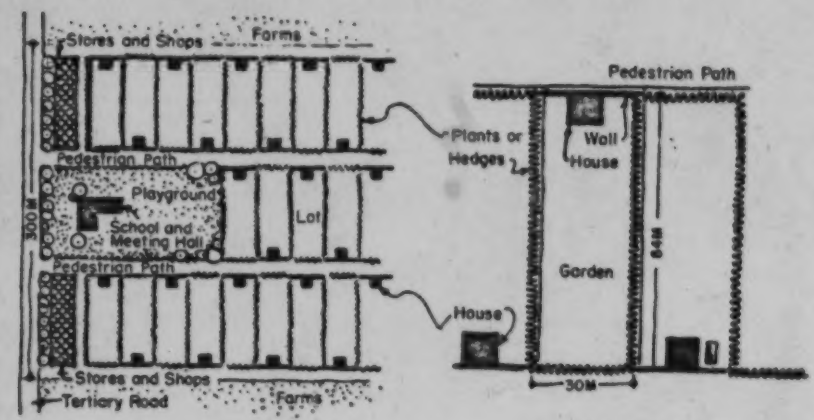


VILLAGE GROUP

EACH RURAL UNIT 'A' MEASURES ABOUT 5KM ON A SIDE. ITS CORE IS A RESIDENTIAL GROUP 'a' WHICH CONTAINS HOUSES, STORES AND SHOPS, SCHOOL AND PLAYGROUND.

FOUR OF THESE RURAL UNITS FORM A VILLAGE GROUP WITH A VILLAGE CENTER COMPOSED OF HOUSES, MARKET AND SHOPS, SCHOOL AND PLAYFIELD, HEALTH CENTER, AND OTHER VILLAGE FACILITIES.



PART OF RESIDENTIAL GROUP
SEE 'a' IN VILLAGE GROUP SKETCHED ABOVE

DETAIL OF LOTS
NOTE THAT HOUSES ARE STAGGERED TO AVOID CROWDING.

DUJAILA LAND SETTLEMENT SCHEME

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361 The Mission has noted elsewhere other defects in the Dujaila settlement: the large administrative staff, the tendency of the settlers to become minor landlords, the lack of participation by the Department of Agriculture, and the rapid deterioration of the soil owing to bad drainage. It has been made too elaborate and there has been insufficient coordination of effort. As a result, the settler relies too much on the benefits he has been given and too little on self-help, largely because self-help has not been aided in the way it should be by the concerted action of the appropriate government departments.

III. Urban Communities

The municipalities in Iraq range from Baghdad, the capital, with well over half a million inhabitants down to small towns with less than a thousand inhabitants. They cannot, therefore, be considered as a homogeneous group. The largest of them have certain distinctive functions.

361 438 Baghdad is the seat of the government, the center of much of the wholesale trade and the hub of the rail and road systems. Since the war, a number of modern factories have been built so that industry is now becoming an important element. It is a rapidly growing city, a particularly large influx having occurred during the war. Growth has taken place along both banks of the Tigris, expansion away from the river being limited by the bunds, which protect the city from flood.

Mosul, the second largest city, has less than a quarter of the population of Baghdad. Lying on the rail line to Turkey, Syria and Lebanon, it is a center of trade to the west, especially in wool. Associated with this trade are industries such as the cleaning and packing of wool and the tanning of hides. In addition, there is a sizeable cotton and rayon textile industry, both factory and handicraft. It is an old city and formerly the capital of the Turkish Vilayet of Mosul; it does not appear to be growing.

Basra, the port on the Shatt al Arab, is really a complex of three towns situated a few miles apart: Magil, the modern sea and air port; Ashar, an older port; and Basra proper. Apart from its

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port traffic and such associated activities as the packing of dates, cleaning of barley and flour-milling (a new industry), Basra is closely bound up with the development of the new oil field at Zubair, some 10 miles inland. Basra, like Baghdad, received a large influx of people during the war, especially from nearby Amara.

The population of Kirkuk, the fourth city, is believed to have tripled in the last 25 years as a consequence of the development of Iraq's major oil field. The two holy cities in Kerbela province, Kerbela and Nejf, have a large transient population due to pilgrim traffic from Iran and other Moslem countries. These two cities have many handicraft workers in such trades as jewelry, brasswork and embroidery.

These six cities, together with Amara, are the only ones with a population of over 40,000. With a few exceptions, such as Khanaqin with its small oil field and refinery, the other municipalities function primarily as centers of administration and trade for surrounding districts. Broadly speaking, their size varies with their administrative importance. Of the provincial capitals, other than those already mentioned, five have a population between 20,000 and 40,000 and three between 10,000 and 20,000. Of the remaining municipalities, none has a population exceeding 20,000; less than 30, most of them centers of *qadhas*, have a population of more than 6,000.

Despite differences in size and function, the cities and towns have a number of characteristics in common. The older parts are usually congested with narrow streets and alleys. Houses are built around courtyards, the only opening to the street being the main doorway. The houses usually have a flat roof or a partially open second story for sleeping outside in the summer. Brick is the commonest building material; most of the larger towns have brickworks nearby, many of which are small and primitive. There are also a few modern concrete and steel buildings, mainly in Baghdad. Schools and hospitals can be found in the heart of these congested areas. An important section in every city is the *Suq* or bazaar, a network of alleys, often covered by crude roofs forming a series of arcades. These alleys are lined with the small shops of retail merchants and handicraft workers in textiles and metals. The *Suq* is usually located near the principal mosque.

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361 The development of the new parts of the cities is in striking
363 contrast to the old. Broad tree-lined boulevards have been laid out in the form of dual carriage-ways, the dividing strip being ornamented with flowers and shrubs. Along these boulevards there has been intermittent residential building activity, so that vacant lots alternate with the houses and gardens of the well-to-do. In Baghdad, particularly, many of these vacant lots have been occupied by squatters. In the largest cities, the new boulevards and the main streets are paved, but the paving is apparently of poor construction, as it has deteriorated rapidly. In the other cities and towns, however, the streets have merely been graded.

365 Most towns with a population of over 6,000, and a few smaller one, have both a piped water supply and an electricity system, which are, with three major exceptions, managed by municipal boards under the direction of the Ministry of Interior. The water is, however, not always purified and the electricity is invariably expensive. No city, not even Baghdad, has a sewage system. Waste water is disposed of into cesspools or allowed to run into the streets where it is apt to collect in stagnant pools.

The Lack of Coordination in Urban Planning

361 In spite of their superficially impressive appearance, the new sections of the cities have not been properly planned. Streets and traffic circles have been laid out according to prescribed geometrical patterns without paying much attention to their functions or to the need for creating integrated residential areas with appropriate housing for the different income groups and provision for schools, shops and hospitals or clinics. In the largest cities, the importance of allocating zones for different purposes and of establishing a proper interrelation between the zones has been largely neglected. Growth has been, in fact, piecemeal and spasmodic rather than coordinated and regular, and emphasis has been placed more on the ornamental than on the useful. Some traffic circles, for example, are unnecessary; others are even safety hazards. The practical value of new streets is vitiated by the common and dangerous practices of using both carriage-ways in both directions and of taking short cuts in the wrong direction around traffic circles. Sometimes streets have been ruthlessly cut or widened through built-up areas

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with little regard for the consequences; the remnants of buildings which have been sliced through at odd angles can still be seen.

By law, the Ministry of Interior, through its Directorate General of Municipalities, is already responsible for the planning of municipalities. The Directorate General of Municipalities in turn has under it the Technical Section for Planning and Organization (or Planning Office) which has among its duties the submission of "technical advice as regards municipal schemes for the organization and planning of cities and towns in accordance with modern principles" and the carrying out of "any of the said schemes which are required to be performed . . .".[8] This office with a staff of 17 does topographic surveys of towns and prepares development plans from such surveys. It also plans for and supervises construction of some municipal structures, including housing, and attends to legal matters concerning land sub-division and assessment.

Also by law, the Ministry of Interior has jurisdiction over the administration of municipalities. Law No. 84 of 1931, as amended, provides that municipalities should attend to "the division of the town into areas having regard to its development capacity and the specification of plans to be followed for the improvement of streets, public places, and buildings in such areas." This particular duty concerning planning is assigned to the Office of the Municipal Engineer.

Although both the Planning Office and the Office of the Municipal Engineer are under the Ministry of Interior, the two entities involved with planning are quite distinct from each other. Duplication of work and conflict in jurisdiction both occur. Municipalities prepare their own plans and then forward them to the Ministry of Interior but apparently they do so only for information, and not for approval. Some plans are merely sketches. Others have been made without surveys. Where surveys have been undertaken, they are mainly topographic surveys showing the existing layout of streets and buildings, and not the diagnostic surveys required by scientific planning. In several cases plans have been altered without submission to the Ministry. Some streets which

[8] Regulation of the Ministry of Interior, No. 39 of 1947.

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have been newly constructed do not appear at all on the records of the Planning Office. The Mission, in fact, found that many major details of developments such as civic centers, markets and the like, either were not shown in the plans or were contrary to the plans as prepared and filed. There were also instances where planned projects under construction were suddenly changed or stopped by a new mayor on his assuming office.

Cooperation of the central government with the local authorities has also been noticeably lacking. The Ministry of Education, without consultation with local officials, prepares school plans, showing not only the details of structures but also their location and distribution. Likewise, the Ministry of Social Affairs, without reference to local administration, prepares plans for hospitals, clinics, social centers, and housing schemes which form definite parts of the community. And, in similar fashion, the Ministry of Communications and Public Works prepares many plans for public works such as bridges, national highways and streets, and government structures designating details not only of construction but also of alignment, orientation and location. All these specialized planning activities are carried on with little or no coordination with the Planning Office in the Ministry of Interior. Even in Baghdad, where better cooperation between the municipality and the various government departments might be expected, a large school building was recently completed, abutting on a busy major thoroughfare, the proximity of which was dangerous for school children. The location was approved despite objections by the Planning Office.

Financial Difficulties

Financial difficulties have contributed to the failure of the municipalities to plan more effectively. A large part of their revenues, which are in any case small, is derived from a share in the petrol and property taxes, the proceeds of which are handed over to the central government and, in theory at least, reallotted to the provincial and municipal governments. In years of financial stringency, however, the government has withheld a large part of these taxes for itself.

For capital funds, the municipalities have to rely on occasional loans—or, in rare cases, grants—from the central govern-

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ment, which are usually forthcoming only at irregular intervals. The loans usually have to be amortized over a period of 10 years or less, which places an onerous burden on municipal finances. The municipal authorities in a number of northern cities, which were allocated funds in the fall of 1950 and had spent a large part of them at the time of the Mission's visit, were still in doubt as to whether they had received a grant or a loan. Uncertainty as to income or capital funds inhibits advance planning. Moreover, when the authorities do receive funds, they are apt to spend them as fast as possible for fear that, if they have not actually been spent, they may otherwise be withheld. The usual way of overcoming this situation, and possibly the only way in the circumstances, has been to build new streets, which are relatively easy to plan and execute. In addition, the municipality is by law entitled to recoup part of its expenses from the owners of land that has increased in value.

The provincial authorities, who are responsible for carrying out the projects of the central government and who might be expected to cooperate more closely with the municipalities, have been faced with similar difficulties. They, too, have had hand-to-mouth experience with capital expenditures. Nearly completed buildings have sometimes been left standing for months, because funds ran out before the construction could be finished. Furthermore, the projects to be undertaken are normally prescribed by the central government. Apparently, some advance on this procedure has been made recently and the *Mutasarrif* and the Provincial Administrative Councils have been given more latitude in planning their own development.

Planning in the Future

The opportunity now exists to substitute an entirely new approach to urban development for the old haphazard methods. An example of how well the development of a town can proceed, given the right spirit of cooperation, is provided by the small town of Bedrah, which lies near the Iranian border in Kut province and which has a population of about 4,000. This project involves the reconstruction of the old town on a new site.

Several streets had been constructed and 24 dwelling units were ready for occupancy when the Mission was in Iraq. Thirty more units were scheduled to be finished during the year. Besides

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these residential structures, there were a number of community facilities: a dispensary staffed by the Ministry of Social Affairs; a primary school building for 200 students and a secondary school building for an initial enrollment of 30 students constructed by the Ministry of Education; and a clubhouse which had been paid for by the people themselves. The municipality intended to erect a market and to install an electric generator. Residences for the *Qaimmaqam* (the administrator of the *qadha*) and the physician were also scheduled to be constructed.

Plans for the development of the new site for Bedrah were prepared by the Planning Office and followed by the local officials in the construction of the project. Work has been proceeding for several years and has been financed largely out of past savings. The whole project has, in fact, been carefully thought out and planned ahead. The initiative was due largely to the *Mutasarrif* of Kut and the success of the project to his close personal relation with the Planning Office.

This example is, unfortunately, an isolated one. In fact, the present status of the Technical Section for Planning and Organization in the Ministry of Interior does not permit comprehensive planning. It has neither the authority nor the staff to guide the planning of public works or buildings that are currently the concern of other ministries. The need for coordinated planning undoubtedly exists, but the function can only be discharged adequately if the Authority is given sufficient staff, trained not only in architecture and civil engineering, but in all the economic and sociological aspects of town planning.

General plans for the development of each municipality could then be based on facts and drawn up with a schedule of priorities, and future work should only be sanctioned if it is in conformity with these plans. Such plans should be practical and preferably designed so that they could be carried out in stages and changed and improved as conditions may demand. The new Community Planning Office should be made clearly responsible for approval of these plans or any changes in them. As a safeguard, funds for municipal development should be disbursed only for purposes which are in accordance with approved plans. This will require amendment of the present Roads and Buildings Regulations, which

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are at present an amalgam of a building code and zoning regulations. These two distinct parts need to be separated and each properly administered.

While the Community Planning Office will have to take the lead in organizing the program, it is essential that it should not attempt to do all the detailed work itself. Although, in some cases, technically good plans may be prepared in this way, the result will be neither popular nor lasting and the planning authority may become a bottleneck. On the other hand, if plans are prepared independently by local authorities or by other government departments, the results will probably be uncorrelated and, therefore, unsatisfactory. The most desirable kind of planning is likely to be achieved by a combination of the two. Although plans should be initiated and later executed by the agencies immediately concerned, the central planning body should guide and coordinate them throughout the various stages. In the larger cities it could probably confine its activity to stimulating interest in the benefits of planning, advising on the preparation of plans and reviewing them at intervals in the course of preparation. In the smaller municipalities, it may have to do more of the actual work, but it should certainly endeavor to enlist as much local advice and cooperation as possible. As was noted earlier, imposition from above is undesirable.

Once plans have been drawn up, the financing of development should be placed on a more satisfactory footing. The principal source of funds for capital expenditure should be the Development Board. Whether they are in the form of loans or grants, they should be committed (although not actually credited) sufficiently far ahead for the municipalities to arrange a schedule of work with some degree of confidence. Loans should be made for a longer period and on less burdensome terms, especially as regards amortization. A careful study of a municipality's finances should be made to assess its probable ability to repay.

Slum Clearance

One of the major problems confronting the municipal authorities is the eradication of the worst slum areas of the cities. In Baghdad and Basra, this is a formidable undertaking, since the influx of people from Amara has been very large. Estimates vary

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widely but probably at least 60,000 have migrated to Baghdad and 20,000 to Basra. Amara province is the heart of the rice-growing marshland, where the water buffalo is the prevailing livestock. The immigrants have naturally tended to recreate the conditions of life to which they are accustomed and which will enable them to raise buffalo. An area just outside the eastern bund of Baghdad has been settled by these people and converted to their normal mode of life. A series of stagnant pools for the cattle is interlaced with narrow paths just above the water-level and surrounded by a disorderly array of makeshift huts, called *sarifas*. Being outside the bund, the area is subject to spring floods in years of high water. In Basra the immigrants have settled along the banks of the existing canals. Conditions there are nearly as bad as in Baghdad.

It is clear that the process of migration and the creation of such slums can only be halted by eradicating the cause, namely, the harsh conditions of life in Amara and other places from which the migrants come. Meanwhile efforts will have to be made to resettle those who have already come, since, apart from the plight of the people themselves, these slums are a menace to the health of the entire population of the cities.

The few measures so far taken to resettle the sarifa dwellers have not been successful. In Baghdad the Ministry of Social Affairs made a plan for 8,000 mud huts at Shamiya which is about 12 kilometers from Baghdad. Several sample huts of defective construction were erected at the site at a cost of ID 35 each. This plan contemplated the housing of approximately 30,000 people from the sarifa district by giving each family 120 square meters of land apiece on which they were to build their own houses according to the samples already constructed. Each hut would have had a covered floor area of 43 square meters consisting of two rooms, a hall and a water closet. The main pipelines for a fresh water supply had been provided and a clinic set up for the use of future residents. The plan, however, was later abandoned on the grounds that the site was too far from Baghdad where most of the prospective residents are employed.

Experience in Basra has been little better. There, the initiative came from the Municipality, which now has under construc-

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tion 750 dwelling units on a site five kilometers from the city. This and three other city development projects were financed by a 10-year bank loan, guaranteed by the Ministry of Finance. The original resettlement plans were, however, hastily and incompetently prepared; they were submitted to the Ministry of Interior only a few days before the foundations were laid. Subsequently they were found by the contractor to be so defective that an advisory committee of experienced engineers had to be appointed to review them. The committee recommended many changes in the layout and site engineering of the project, in the design of the houses and in the specifications of materials. Some of the changes, including the installation of an adequate sewage and drainage system, had to be made after construction was well under way.

Ultimately the cost of two-room houses is expected to be about ID 250 and of three-room houses, about ID 300. It is unlikely that the sarifa dwellers can afford to purchase these houses by installment as originally intended. The Municipality now has in mind to build 1,000 mud-and-mat huts at a cost of ID 40 each for sale to the sarifa dwellers.

Other cities besides Baghdad and Basra have their slum problems, though not necessarily of the same kind. For example, all but the most modern part of Erbil is situated on a high mound, rising almost sheer from the surrounding plain. On this mound, which is probably on the site of a city continuously occupied for several thousand years, the houses are packed together with only narrow alleys between them. Waste water runs down the middle of the alleys. The incidence of tuberculosis is said to be high. Less extensive examples of these so-called ancient "citadels" can be found elsewhere, for example, in Kirkuk and at Nabi Yunus near Mosul.

The problem of resettling large numbers of slum dwellers varies, in kind and in degree, from city to city, but it should in essence be treated as a national problem. It is too important to be subjected to the kind of expediency and faulty technical planning with which it has so far been approached. The job is one for the new Housing Authority, although the municipalities will clearly have to play their part.

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362 With more realistic planning, the mistakes previously made could be avoided. Preliminary investigation of the incomes and occupations of prospective occupiers of a resettlement project should be made in order to suit the site development and the cost of the buildings to the needs and incomes of the people. Sites should be well drained and within easy access to places of work. Depressed areas where water is liable to collect into stagnant pools should be avoided. If the only available site is still deficient from the point of view of drainage, then the ground should be improved by grading and filling before any hut is constructed. Too often in the past, the availability of government-owned land has been the governing factor in the choice of site without regard to the availability of places of employment, community facilities and public services.

Plans should be worked out for the construction of integrated neighborhoods with facilities such as safe water, sanitation, school, playground, market and health center. Their construction should be programmed over a number of years. The dwellings would have to be very simple, if the state is not to make large subsidies, which the Mission does not recommend. Instead, the same principles of aided self-help might be employed as in the villages. For example, simple but liveable mud-and-mat huts could be designed in such a way and with sufficient lot area so that their occupants could improve and extend them as they earn more income or as their families grow bigger. To improve the durability and strength of the walls, the mud of which they are made should be stabilized with materials like cement or reinforced with reeds or grass. To insure proper siting of structures, the government might stake out the foundations and help furnish some of the needed materials such as cement for stabilizing the earth floor. As an incentive toward completion, the government might also furnish one of the final elements of the self-built house, such as the roof. If representatives of the prospective occupants could be interested and consulted at an early stage and if places of employment were taken into consideration at the same time, the projects would stand a much better chance of success, for they would be not only better places in which to live but also better places in which to make a living.

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IV. Housing

Although the resettlement of slum dwellers and the improvement of living conditions in the villages constitute by far the largest housing needs of the country, the provision of adequate housing on reasonable terms to workers on a somewhat higher income level is also important. Efforts in this direction have been started by the central and municipal governments, by the two quasi-public transport organizations and by the Iraq Petroleum Company. Private entrepreneurs have found it profitable to concentrate largely on construction for the well-to-do. Some of the projects have good features, particularly that carried out by the IPC. Generally, however, defects are such that there is clearly much that a Housing Authority could accomplish.

The Need for a Housing Authority

The need for a Housing Authority is twofold. First, it is required to take the initiative in providing suitable housing for the lowest economic strata of the population, such as the Baghdad sarifa dwellers. This is a special kind of problem, which cannot be expected to be undertaken by other agencies. Secondly, it is required as a general, policy-making, coordinating and advisory agency. In this there is no suggestion that it should try to undertake housing for the whole country. On the contrary, initiative from municipalities, quasi-government agencies and private concerns should be welcomed. The function of the Authority should be to give technical, legal and financial assistance where it is required; to prescribe certain minimum standards; and to act on its own initiative only in cases where there seems to be both an urgent need and no alternative.

It will be necessary for the Authority to initiate a systematic survey in order to assemble all the necessary data for the formulation of a national housing program. Census data will be helpful, but probably additional assistance will be required from the statistics department of the Ministry of Economics in devising sampling techniques in order to determine the requirements. These would be especially useful in resettlement projects for sarifa dwellers.

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Due to the nature and magnitude of the work involved, the Housing Authority should be firmly established in the Ministry of Social Affairs and provided with powers commensurate with its responsibilities so that it may perform its functions effectively. It should ultimately have a staff composed of technical men trained in housing design, architecture, site and sanitary engineering, law and project management. As in the Community Planning Office, they should also have some knowledge of the sociological and economic aspects.

On the financial side, the Housing Authority should be provided with a Housing Fund to which the Development Board would allocate money set aside for housing and into which the proceeds of rentals would be paid so that maintenance and repairs could be financed without constant resort to the Treasury. Pending a housing survey the amounts set aside for housing in the five-year program of the Development Board, namely ID 300,000 annually, might be increased to ID 400,000 as a provisional target for housing expenditures.

[816]

On the technical side, the Housing Authority should be complemented by the establishment of an Applied Building Research Station attached to the proposed Department of Research and Standards in the Ministry of Economics. Such a station should test, develop and demonstrate improved methods and techniques for low-cost housing; collect and disseminate technical housing and building information; experiment with and develop new uses of local building materials, construction methods and house designs; and carry on other useful research in the housing field. The Station should be staffed as far as possible with local technicians, but for the first year or so one or two building research experts from abroad should be engaged to start and run the Station and train the local technicians in order to enable them to operate the Station themselves after a time. A new building should be constructed for the Station and equipped with the basic instruments and machines necessary for starting tests and experiments. It will clearly be necessary for the Authority to work closely with the Station and to insure that the broad outlines of its work conform with the need of the country.

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Labor and Materials

The Housing Authority could also take the lead in improving the quality of labor and materials in order to bring the costs of building down. In this task, it should cooperate with the Ministry of Education in reorganizing training methods. It could also advise the Industrial Bank on desirable types of specifications of building materials and should estimate probable requirements so that the Bank could initiate investment to this end in partnership with private enterprise.

The materials produced locally for housing construction are on the whole inferior and expensive. For example, a casual inspection of house construction in the cities will reveal that unevenly burnt bricks with cracks and chipped-off edges and corners have been and are being used. To remedy the shortage of good building materials, foreign goods have been imported at high cost. In the case of the IPC housing project, it was estimated that the cost of imported steel window and door sashes alone amounted to as much as 20 percent of the cost of the structures.

The inferiority of building materials is matched by the poor quality of building labor, which again adds to the cost of construction. There is urgent need for good carpenters, masons, plumbers, electricians and painters. Unfortunately, attempts to improve skills through vocational schools have not been altogether successful. The schools lack competent instructors, a number of those teaching in Baghdad, for example, being illiterate. Workshop accommodations are restricted and the equipment is out-of-date or in bad condition. These deficiencies might be overcome by importing instructors from neighboring countries, by obtaining new equipment and by running evening classes until more laboratory space is available. This is not, however, the full answer. Graduates from vocational schools tend to prefer desk jobs to field work. It would be preferable to concentrate more on training schemes on the job under good supervision.

Government Housing

The Ministry of Social Affairs is empowered by Law No. 38 of 1941 and Law No. 22 of 1945 to "construct dwellings for

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362 laborers at government expense" which may be sold or leased to them in accordance with special regulations.

[152] Housing projects have been financed by allocation from the capital works budget prepared every year. The unspent balance from this allocation reverts to the general treasury. Likewise the rents paid by tenants and the fees collected for maintenance, sanitary services, water and electricity find they way back to the general treasury. The 1950-51 budget provides ID 75,000 for housing. The five-year program of the Development Board envisages an increase to ID 150,000 in 1951-52 and to ID 300,000 in each of the four succeeding years.

The Ministry's principal project is at Tel Mohamed, about seven kilometers from Baghdad, where 204 brick dwelling units had been constructed by the Ministry of Public Works in 1946 and a further 185 are now under construction. Twenty shops are also being built. Most of the houses have a bedroom, a living room, a kitchen, a water closet and one or two verandas, but 50 of the newer ones will have two bedrooms. Floor area ranges from 49 to 71 square meters and the cost from ID 268 to ID 323, excluding the cost of development and of land which is government-owned. Lots were 150 square meters for the older houses, but the newer ones are smaller.

Rentals for the first dwelling units in the Tel Mohamed Project used to be ID 2.0 a month, but this was reduced later to ID 1.5. The government supplied water and electricity at an additional charge of 500 fils a month. Based on the actual cost of construction of each unit (ID 305) a generous estimate of 20 years for the life of the structures, interest on capital investment at the rate of six percent per annum and a nominal sum of ID 10 annually for maintenance of grounds plus repairs and land rental, the economic rent for each such unit would be ID 3.0 a month—that is, if no vacancy and unforeseen circumstances occurred to reduce the income from the project. In other words, the government has to make a subsidy equal to the present rental of ID 1.5 per month, if it hopes to replace these houses at the end of their estimated life.

In addition to these units in Baghdad, the Ministry requested bids for 40 one- and two-bedroom units in Basra which it rejected because the prices were too high, mainly because bricks made in

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the vicinity of Basra were not up to specifications and the additional cost of haulage from Baghdad had to be borne. 362

Municipalities, which come under the Ministry of Interior, carry out projects such as those at Bedra and Basra. For various reasons, principally lack of finance, there have been few such projects. Other ministries occasionally provide houses for their officials who are stationed in the provinces, but, on the whole, the standard of housing for these officials is deplorably low. The incentive to obtain jobs in Baghdad is already considerable. The government needs able officials who will work willingly in the field and who will have a standing in their community. A decent house is certainly one of the prerequisites to attract such men.

Housing by Transport and Industrial Enterprises

The Port of Basra, which has over 5,000 employees, is at present completing the construction of 50 dwelling units for junior employees and is contemplating further building. Although there are plans for smaller houses of 45 square meters to cost about ID 300, most of these houses, which are of brick, concrete and steel, are much larger and have such additional facilities as a bath, storeroom and veranda leading to the roof. Their cost is, accordingly, high, ranging from ID 1,500 to ID 2,000, but they are let at a nominal rent.

Although the buildings were well designed and the materials used were of good quality, the site planning was not thoroughly studied. Too many structures were crowded in a limited area in spite of the fact that the Port has plenty of available land at its disposal. The yard spaces between the buildings and the high brick fences separating the units are hardly six feet wide. Buildings having different orientations have identical plans.

In 1926 the Iraqi State Railways started a program for the replacement of temporary buildings built after World War I. It is estimated that about 60 percent of the needed permanent quarters for artisans and laborers in stations other than those in Baghdad and Magil (Basra) have already been provided. Suitable quarters at Baghdad and Magil have been provided only for those members of the staff who are required, for operational reasons, to live in close proximity to the work.

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362 The quarters which have so far been provided for laborers and artisans of the Iraqi State Railways are: 283 units consisting of two-room quarters, 2,090 units of one room and 60 units of sarifas.

Shortly after World War II, the Iraq Petroleum Company embarked on a large housing project in order to provide accommodation for its entire staff of artisans and their families. This was done because the increase in its activities and employees had caused a strong pressure on the available housing in Kirkuk. When rents became exorbitant, the company give its employees a rental allowance, but this failed in its purpose as rents rose by a corresponding amount almost immediately. The project has already succeeded in lowering rents in the town, the artisans' families who have moved in having released space in the town for laborers' housing. It is not proposed to extend the project to laborers' housing, first because of the shortage of materials and secondly because of the generally transient nature of the unskilled labor force.

The present housing project under construction in the Arrapha Ridge Area near Kirkuk will be finished in five to six years and will eventually consist of 1,028 houses. Of this number, 284 have been completed and accommodate about 1,485 people. At present [342] there are 58 more under construction. There are three basic types of houses: the one-bedroom, the two-bedroom and the three-bedroom semi-detached and attached units. Except for relative sizes and the number of bedrooms, the various types of houses have the same number of rooms: a living room, a kitchen, a storeroom, a bath, a water closet, a veranda and an enclosed courtyard. Stairs lead up to the flat roofs. The houses are surrounded by gardens.

The houses have walls made of bricks and stones with portland cement mortar, floors and ceilings of concrete, and window and door sashes of steel and glass. They are provided with both cold and hot water and with electricity. Each one-bedroom unit costs about ID 1,400 to build including utilities, and rents for ID 3.6 per month plus a service charge for water, power, etc., of ID 1.2. The biggest or three-bedroom unit costs about ID 3,000 and rents for ID 7.5 per month plus a service charge of ID 2.1.

The housing project has been planned on the neighborhood unit scheme—there being two units with schools, open spaces, stores and clinics. In addition the entire project will ultimately

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have a mosque, a church, a post office, a cinema, a restaurant, a police station and an institute equipped with reading rooms and a debating chamber. Streets and alleys are laid out to conform to the ground contours and paved with asphalt macadam. The streets are lighted and have recently been planted with trees. The project is much in advance of anything else that has so far been undertaken in Iraq, but its cost and the large element of subsidy involved make it impossible of general emulation.

The Iraq Petroleum Company is the only large private industrial concern which has provided substantial housing facilities for its employees, although in 1943 a law was approved compelling industrial project owners to construct houses for their laborers. This law has apparently been ineffective. Although there is much to be said for placing responsibility on industry for housing in out-of-the-way places, the Mission is of the opinion that, in general, provision of housing is an inappropriate burden on industry.

Private Housing; Mortgage Credit

The most spectacular ventures in private housing in recent years were two grandiose developments in Baghdad for the well-to-do. Both of there were financial failures.

Private housing of a more modest character for the middle classes, who cannot afford large outlays, requires assistance in the form of mortgage credit. In the main report, the Mission has recommended that the facilities offered by the Government Mortgage Bank be augmented. Instead of the original capital of ID 100,000, capital resources of ID 1,500,000 are suggested. The duration of loans, which is now limited to four years, should be increased to 15 years where it is considered desirable.

V. Public Utilities

As indicated earlier, considerable progress has been made in providing the larger towns with water and electricity, but sewage systems have been wholly neglected. The Ministry of Interior is, with a few major exceptions, responsible for the planning, installation and general supervision of these public utilities. The actual

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operating is under the control of Municipal Water and Electricity Boards. The Boards appear to be inexperienced in the management of such concerns, financial control being especially inadequate.

Water

One of the prime requisites of a community is a safe water supply. The principal source of water is the rivers. The Tigris, the Euphrates and their tributaries offer continuous and generous supplies of fresh water during the entire year. Communities have naturally stayed close to these sources of water and close to the many irrigation canals which now extend from the river systems.

While water from the rivers and irrigation canals is fresh (low in salt content), it nevertheless is high in colloidal and organic material, and usually high in bacteria. It is necessary, therefore, to treat such supplies of water for human consumption if general health is to be maintained (see Annex D, *Health*).

There are also a number of communities, mainly in the North, which are not situated near surface sources of water. These have to rely on subsoil water which, although it may be free from pollution, is apt to be brackish.

The first modern water works was constructed shortly after the first World War. Development in this field has reached the point where approximately 40 municipalities have modern water systems, the outstanding ones being in the larger cities of Baghdad, Basra and Mosul. All water works follow a similar pattern and consist of a raw water pumping station, sedimentation tanks, sand filters, chlorine treating equipment and an elevated surge tank. The capacity of the various water works is usually premised on the basis of 25 gallons per person per day with an allowance for a population growth in 25 years of 1.5 percent per annum.

Administration by the Water Boards has thus far been good. The Boards have established water rates for large consumers on a metered basis, while small consumers receive a flat rate. In either case, the rates are very reasonable and vary from 10 to 30 fils per cubic meter or from 100 to 250 fils per month, where a flat rate is established.

The development of municipal water systems has not taken place as rapidly as it should, primarily because of the lack of suffi-

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cient funds. The Department of Municipalities, however, anticipating assistance from the Development Board in its financing, has prepared a plan of construction during the next five years which will include the expansion or construction of new facilities in 114 municipalities having an aggregate population of approximately 950,000. The plan is practical and technically follows present methods. Many of the treatment plants are of the same size. This, fortunately, permits standardization which considerably reduces capital costs. The total estimated cost of the program is ID 5,651,600 of which approximately 50 percent would be in foreign exchange, mostly in sterling.

There are numerous villages in addition to municipalities where the problem of obtaining water is very critical. In many cases, this could be relieved by either a single well or by pumping small quantities of water at some distance from streams or irrigation ditches. Such sources of water would in many cases be impure and would require the use of clay filters. Nevertheless, it would relieve the people of the burden of carrying water for human consumption a great distance. These facilities should not cost more than ID 1,500 per installation.

With the need for pure water so critical, it is recommended that the Development Board assist the Department of Municipalities in financing the five-year program for the municipalities. In the meantime, the Department should study the problem of supplying water to the numerous villages and formulate plans for consideration by the Development Board.

Sanitation

Adequate disposal of waste water is an acute problem throughout Iraq and a long-term program needs to be drawn up. Pending this, a start should be made with a sewage system in Baghdad, since the rise in the subsoil waters makes the need of this city most acute. In 1947, an English firm prepared a report on the installation of a sewage and drainage system for the city—complete with pumping stations, sewage purification works, etc., and estimated to cost ID 4,600,000 on the east bank of the Tigris and ID 4,300,000 on the west bank. The proposed scheme could be undertaken in stages.

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365 The initial step might be to carry out the plan for the east
364 bank according to a schedule based on the relative importance of its various elements. It would be useless, however, to proceed unless connections with the system are made compulsory for all property owners. No new constructions or major building alterations or enlargements should be permitted without adequate provision for such connections. Existing structures which are connected to the water supply system should be required to connect gradually to the sewer, according to a scheme to be worked out by the government and based on sanitary, engineering and financial considerations. The administration of the sewage system would logically come under the jurisdiction of the Water Board. The system might be made to help pay for itself by setting a certain surcharge over the cost of water actually used and then discharged into the system.

For the other larger cities, surveys should be conducted now to gather the data necessary for the actual design of each system. For example, the preliminary studies for the sewage problem of the City of Mosul should be preceded by a topographic survey. It is believed that the entire flow of the sewage and rain water could be designed so that no pumping will be needed. Chemical treatment of the sewage is to be preferred to discharge into the Tigris, because people living in downstream villages get their drinking water directly from the river.

For the smaller towns and villages, efficient and inexpensive individual sewage disposal units should be installed privately according to models prepared and tested by the government. Community bath and toilet facilities should be provided in the poorer sections of towns to supplement private individual units. Public lavatories should also be provided in the cities wherever there are concentrations of people, such as in business areas, parks and other public places.

Electric Power

365 Municipal power plants serve primarily public and domestic
377 lighting needs. Most industrial plants supply their own power. Cheap fuel also makes it possible for small direct-connected diesels to compete favorably with electric motors as prime movers, pri-

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marily because the capital cost of all the electrical equipment is eliminated. It is chiefly for this reason that there are over 3,000 large diesel-driven irrigation pump installations along the Tigris and Euphrates Rivers, many of them very close to electric generating stations. In a similar manner, most of the older industrial enterprises and even many of the new ones have followed the same practice of using diesel engines as a source of power. In the field of public transportation, diesel or gasoline engines are universally used as a means of motive power, while kerosene and other fuels meet the country's needs for domestic heating and cooking. It is not surprising, therefore, to find the development of electric power to be on a very small scale and the per capita consumption among the lowest in the world; the total generating capacity in utility plants operating for public use is not more than 65,000 kw. Of this 42,000 kw. serves the city of Baghdad and 9,000 kw. is at Basra

Production and distribution of electricity in Baghdad are carried on by the Baghdad Light and Power Company and in Basra by the Port Authority. In Kirkuk the municipality receives its power from the Iraq Petroleum Company's large plant but is responsible for distribution. In all other municipalities, the electricity system is run by the local Electricity Board.

Recent expansions by the Baghdad Light and Power Company and by the electric plant in Basra appear to be adequate for the immediate future, unless new industries or other heavy loads create power demands beyond those now anticipated. Apart from Kirkuk, however, the remaining municipalities are badly in need of power. To meet this need, the Department of Municipalities has established a plan of development which is very practical. This plan calls for the construction of new plants in approximately 56 municipalities having an aggregate population of 175,000 and the expansion of existing plants in 47 municipalities having an aggregate population of approximately 750,000. All plants would be based on the use of relatively small, slow-speed, heavy-duty, diesel-engine generators having a combined capacity of not over 10,000 kw. Fortunately, many of the generating units would be identical, permitting standardization and allowing maintenance to be carried out by central repair facilities. It is estimated that the total cost including

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distribution systems would be approximately ID 1,550,000, of which ID 1,000,000 would be in foreign exchange, mostly sterling. The financing of this development will need to be undertaken by the Development Board.

It is important, however, that expansion of supply be accompanied by thoroughgoing measures to assure more efficient management. The only utilities that can be said to be operated efficiently are those at Baghdad and Basra. In spite of a considerable burden on its revenue (see Annex D, *Industry*), the Baghdad Light and Power Company charges the lowest rates in the country, pays regular dividends to its stockholders and finances plant expansions from reserves set aside for such purposes.

Rates charged by the municipally-owned plants vary widely, and, generally speaking, are twice those in either Baghdad or Basra. In some localities, the demand for power is so much greater than supply that rates are made exceptionally high for the purpose of discouraging the normal use of electricity by large consumers. Distribution losses are frequently as much as 36 percent and because of poor maintenance an engine generator is seldom capable of operating at more than 50 percent of its designed rating. Records are also very poor and in some cases nonexistent. It is obvious, therefore, that the present form of administration is unsatisfactory and must be changed if the consumer of electricity is to be adequately served. It is recommended, therefore, that all publicly-owned electric utilities be placed under the management of a competent private firm like the Baghdad Light and Power Company by means of a mutually satisfactory operating contract. The contract should require all operations to be conducted in accordance with sound utility practices and it should include some incentive to reduce rates to the level now enjoyed in Baghdad and Basra.

It has sometimes been argued that hydroelectric power should be developed as part of the projected water-storage schemes. While the possibility of such development undoubtedly exists, the Mission believes that thermal plants are at present the most economic source of power in Iraq. Hydroelectric plants require a much higher capital investment than thermal plants. They tend to be economical only where fuel costs are relatively high and there is

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a comparatively high and steady demand for power. In Iraq, however, fuel is very cheap and electricity is principally used for lighting so that the load factor is low. Moreover, hydroelectric power would have to be transmitted at considerable expense over long distances to the principal centers of consumption, since the potential hydroelectric power sites are all in the North. The possibility of developing hydroelectric power in connection with the Wadi Tharthar project nearer Baghdad appears problematic.

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[For a detailed outline of the Development Program for Iraq recommended by the Mission which went to Iraq in 1951, see category 116, pp. 72-119.]